ANNUAL REPORTS

OF THE

Dairymen's Associations

OF THE

PROVINCE OF ONTARIO

1908

(PUBLISHED BY THE ONTARIO DEPARTMENT OF AGRICULTURE)

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TORONTO.

To the Honourable JOHN MORISON GIBSON, K.C., LL.D., *etc., etc., etc.,*
Lieutenant-Governor of the Province of Ontario.

May it Please your Honour:

I have the pleasure to present herewith for the consideration of your Honour the Report of the Dairymen's Association of Western Ontario for 1908, and the Report of the Dairymen's Association of Eastern Ontario for 1908.

Respectfully submitted,

JAMES S. DUFF,
Minister of Agriculture.

Toronto, 1909.

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OFFICERS FOR 1909.

Dairymen's Association of Eastern Ontario.

Hon. President....................Hon. D. DERBYSHIRE, Brockville.
President..........................J. R. DARGAVEL, M.P.P., Elgin.
1st Vice-President...............HENRY GLENDINNING, Manilla.
2nd Vice-President...............J. H. SINGLETON, Smith's Falls.
Secretary..........................R. G. MURPHY, Brockville.
Treasurer..........................J. R. ANDERSON, Mountain View.

Directors.

JOHN H. SINGLETON......Smith's Falls.
NEIL FRASER.............Vankleek Hill.
EDWARD KIDD............North Gower.
NAPOLEON LONGTIN.......The Brook.
JOHN MCGREGOR..........Alexandria.
PETER MCDERMID.........Avonmore.
C. F. WHITTAKER........Williamsburg.
JAMES A. SANDERSON......Kemptville.
JOHN R. DARGAVEL, M.P.P., Elgin.
Hon. D. DERBYSHIRE...Brockville.
T. A. THOMPSON........Almonte.
JOSEPH MCGRATH.......Mount Chesney.
W. J. PAUL, M.P.P ....Tamworth.
JAMES WHITTON....... Wellman's Corners.
ALEX. HUME............Menie.
G. A. Gillespie.........Peterborough.
HENRY GLENDINNING...Manilla.
ALEX. S. WHITE........Sidney Crossing.

Association Auditor..................JOHN HYATT, West Lake.

Dairymen's Association of Western Ontario.

President.—J. J. PARSONS, Jarvis.
1st Vice-President.—JNO. H. SCOTT, Exeter.
2nd Vice-President.—WM. WADDELL, Kerwood.
3rd Vice-President.—D. A. DEMPSEY, Stratford.
Secretary-Treasurer.—FRANK HERNS, London.

Directors.

J. N. PAGET, Canboro.
S. R. WALLACE, Burgessville.
S. E. FACEY, Harrietsville.
GEO. M. MCKENZIE, Ingersoll.
J. B. SMITH, Alton.
W. S. STOCKS, Britton.

Auditors.

J. A. NELLES, London.
J. C. HEGLER, Ingersoll.

Representative to Canadian National Exhibition, Toronto.—ROBT. JOHNSTON, Woodstock.

Representative to Western Fair, London.—I W STEINHOFF, Stratford.

DAIRY INSTRUCTORS AND SANITARY INSPECTORS, 1909

EASTERN ONTARIO.

G. G. PUBLOW, Chief Instructor, Kingston.

J. F. SINGLETON (Kingston), Instructor in Creameries in Western section an Assistant to Chief Instructor in Cheese Factory Work.

Group.	Cheese Instructors.
Napanee	Geo. Bensley, Napanee.
Kingston	H. Brintnell, 133 Alfred St., Kingston.
Cornwall	J. Buro, Mille Roches.
Lindsay	D. J. Cameron, Campbellcroft.
Plantagenet	Jos. Charbonneau, Plantagenet.
Brockville, W.	S. S. Cheetham, Gananoque.
Ottawa	W. W. Dool, 117 Cooper St., Ottawa.
Perth	J H. Echlin, Balderson.
Chesterville	T. J. Ellis, Chesterville.
Ottawa, W.	R. E. Elliott, Carp.
Kemptville	W. G. Gardiner, Kemptville.
Vankleek Hill	W. G. Graham, Vankleek Hill.
Campbellford	R. T. Gray, Marmora.
Belleville	Hugh Howey, Belleville.
Finch	C. B. Larry, Finch.
Madoc	J. B. Lowery, Frankford.
Alexandria	A. McDonell, Box 30, Alexandria.
Brockville, N.	P. Nolan, Philipsville.
Morrisburg	C. W. Norval, Williamsburg.
Picton	T. E. Whattam, Picton.
Almonte	W. J. Ragsdale, Smith's Falls.
Ottawa, E.	Isaac Villeneuve, Casselman.
Peterborough	R. W. Ward, Foxboro'.
Brockville, E.	A. H. Wilson, Athens

WESTERN ONTARIO.

FRANK HERNS, Chief Instructor, London.

FRED DEAN, Guelph,
MACK ROBERTSON, St. Marys, } Creamery Instructors and Sanitary Inspectors.

Group.	Cheese Instructors.
Listowel	Jas. R. Burgess, Listowel.
London	Arthur E. Gracey, Dorchester.
Brantford	R. H. Green, Cayuga.
Ingersoll and Woodstock	E. N. Hart, Ingersoll.
Stratford	Alex. McKay, St. Marys.
Simcoe	Geo. Travis, Tillsonburg.

FINANCIAL STATEMENTS.

DAIRYMEN'S ASSOCIATION OF EASTERN ONTARIO.

RECEIPTS.

Balance from audit of 1907	$ 849 37
Ontario Government grant	2,000 00
Prince Edward County grant	300 00
Town of Picton grant	200 00
Miscellaneous grants	45 00
Borrowed from bank	500 00
Windsor Salt Co.	50 00
Cash from advertisers	235 00
Fines	1,175 07
Total	$5,354 44

EXPENDITURE.

Annual Convention:	
Expenses of officers and directors	$ 400 00
Clerical assistance	50 00
Reporting convention	110 00
Rent of buildings	175 00
Paid for talent for entertainment	40 00
Expenses of local men	25 41
Advertising	148 85
Miscellaneous	38 40
Executive Meetings:	
Expenses of officers and directors	466 00
District Meetings:	
Services and expenses of speakers	625 15
Advertising	79 20
Rent of halls	15 00
Salaries of officers (Secretary, $300; Treasurer, $100)	400 00
Services of Auditor	25 00
Postage, stationery and express	143 90
Programmes and printing	153 75
Dairy Farm Competition (prizes)	50 00
Official prosecutor	1,098 23
Subscription for stock in *Canadian Dairyman and Farming World*	450 00
Repaid loan from bank	500 00
Bank charges on cheques	5 70
Miscellaneous	127 75
Balance in bank	227 10
	$5,354 44

DAIRYMEN'S ASSOCIATION OF WESTERN ONTARIO.

RECEIPTS.

Cash on hand from previous report	$1,417 7
Members' fees	347 0
Legislative grant	2,000 0
Money received from prosecutions	920 0
Sale of exhibits	1,594 6
Advertising in program	150 0
Total	$6,429 3

EXPENDITURE.

Cash paid for prizes	$360 0
Expenses for conventions or regular meetings	140 3
Stenographers' salary, $420.00; directors' fees and expenses, $203.55	623 5
Postage and stationery, $147.82; printing, $186.38; advertising, $130.96	465 1
Judges' expenses, $20.00; lecturers' expenses, $215.45	235 4
Inspectors' salaries, $435.00; other expenses of inspectors, $191.58	626 5
Periodicals for members	234 8
Cost of reporting	75 0
Refund to member, $1.00; office furniture, 21.45	22 4
Purchase of exhibits	1,620 9
Office light, cleaning, sundries	62 7
Office rent, $120.00; auditors' fees, $13.00	133 0
Telephone and telegraph, $85.98; express and storage, $15.60	101 5
Half fine paid to factories	460 0
6th, 7th, 8th and 9th call on stock, *Canadian Dairyman and Farming World.*	400 0
Balance on hand January 2, 1909	867 8
Total	$6,429 3

Dairymen's Association of Eastern Ontario.

ANNUAL MEETING.

The thirty-second Annual Convention of the Dairymen's Association of Eastern Ontario was held in the town of Prescott, on January 6th, 7th and 8th, 1909.

In spite of the fact that it had rained in torrents the night before, and that the sleighing had disappeared, there was a good attendance at the opening session, which began at 10.30 a.m. In the absence of the mayor, the chair was taken by Dr. Reid, M.P.

PRESIDENT'S ADDRESS.

By John R. Dargavel, M.L.A., Elgin.

I have no apologies to make for appearing before you to-day to open this Dairymen's Convention in Prescott, which, I hope, will be as great a success, as any which have preceded it.

Your town sent representatives, in the persons of Messrs. Evanson and Elliott, to wait upon our executive committee and ask for the holding of this Convention in Prescott, and notwithstanding the fact that other towns were represented at that meeting, these gentlemen urged their claims so strongly and overcame every objection which was raised against it with such convincing arguments, that an unanimous vote said "Prescott for the next place of meeting."

I am very much pleased to learn from our secretary that at no other town or city has he met with more encouragement and a desire to make this Convention a success than has been shown by the people of this historic town of Prescott. I desire on behalf of the board of directors to thank you for the kind reception extended to us, and for the kind assistance given by your local committee and others to our secretary in making the usual preliminary arrangements for this meeting.

In looking over the year just closed and summing up the output of the dairy products of Canada we again find a marked falling off of the exports of cheese, but an increase in the output of butter.

The aggregate value of Canadian cheese and butter exports for the season just ended was approximately $18,987,340 as compared with $20,186,-398 for 1907, a decrease of $1,999,058; but if we make comparison with 1906, which amounted to $25,999,034, this season's returns would show a decrease of no less than $7,011,694.

This review has to do with the exports only, but as was pointed out by J. A. Ruddick, Dairy Commissioner, in a statement which he made before the Select Committee of Agriculture, at the last session of Parliament, this cannot be taken as a correct basis upon which to estimate the amount of money derived from the manufacture of butter and cheese in Canada. While the growth of the population was small this might answer, but with increased immigration we have had a rapid increase of home consumption, which we

must not overlook. That there was less cheese made in Eastern Ontario than in the year previous goes without saying, and an enquiry as to the cause might be in order. Owing to extreme dry weather during the summer of 1907, many farmers found themselves short of feed to get their cattle through the winter of 1907-08 and thousands of milch cows were sold for almost nothing to reduce the number for which feed must be produced. This was, without doubt, one of the things which contributed to the short make. The shortage of feed in the spring of 1908, and a drouth during the summer following, caused the farmers to buy considerable feed. In consequence, less revenue was derived from their dairy business, although the prices ruled slightly higher during the year of 1908 than in any of the previous years; but the farmer is slowly learning the lesson of the necessity of better cows, better farming, more feed, and cheaper production, and I am going to predict that, if not in the season just ahead of us, the near future will see us not only making a quantity as great as in the years of our largest make of cheese in Canada, but to years of larger make than Canada has ever known.

The Province of Ontario has 1,096 cheese factories, 86 combined butter and cheese factories and 102 creameries, making a total of 1,284 factories. The products of these factories play an important part in the progress and prosperity of the Province, being one of the chief sources of income and profit of the farming community.

It is not too much to say that the superior quality of our cheese has had much to do with the increased demand for our goods in England. The English consumer likes a good article, and we have been able to largely satisfy his fastidious taste and secure his trade; but there is still room for improvement, and we must strive for better things, if we are to hold our own in the English market, which is open to the competition of the world. We should, I think, congratulate ourselves, that we have been able to build up such a large and profitable trade, which I hope and believe will see a greater expansion in the years to come. But we must not stand still, as there is much yet to be done. Not long since a Scottish Agricultural Commissioner on his return home to the Old Country from a visit of inspection of dairying in Canada, stated that, "the stables in which some Canadian cows are kept are not as clean as they ought to be," and he coupled with this suggestion that something should be done to induce the Imperial Government to see that the Canadian authorities enforced a system of inspection in the Dominion of Canada as rigorous as that applying to dairying in the "Old Country." Does this not look like a danger signal? I must confess that I believe this Scottish agriculturist has cause to make this statement and my belief is founded on personal knowledge of the condition of some stables I, myself, have seen. To my mind, it behooves us to bestir ourselves in the direction of meeting in advance any objections which may be urged against our methods.

As president of this Eastern Ontario Dairymen's Association, perhaps I should not boast of what it has achieved in promoting the dairy interests of this Province, but a modest reference to its work may be mentioned. Does any person present think that the bringing in of 200 cheese factories two years ago to receive instruction and sanitary inspection which they had not been receiving before would have been accomplished if there had been no Dairymen's Association to discuss this situation and urge its necessity upon the Government through some of its members? I say no, emphatically no.

When I, as your president, asked the Government to take off the fee of $15 from factories for instruction which meant about $15,000 to the farmers, does any person suppose this would have been done and this saving effected for the dairymen if no Dairymen's Association were speaking through me? I think not.

Do you think the "Milk, Cheese and Butter Act," which was assented to on the 14th April last would have been enacted if there was no Dairymen's Association to show the necessity of this kind of legislation? I think not.

Do you think that the factory owners and patrons would to-day stand relieved from the prosecution of the offenders of this Act, if there had been no Dairymen's Association to step in and appoint two competent men and pay the entire cost of their services to do this work for you for the year just passed? I think not.

Do you think that the special dairy meetings would have been held in your various counties, at your very doors, and competent men sent to talk upon dairy topics specially, if there were no Dairymen's Association to urge the neccessity of so doing and pay the cost of them? I think not.

But, gentlemen, I am proud to be able to say that such an organization does exist. To those who think this Association has lost its usefulness, I would say, that if there is no other reason alone than the fact that it has been, and is now, the connecting link between the dairymen and the Government you could not afford to do without it. You cannot afford to barter away the organized effort which this Association has sed for the upbuilding of this industry for the individual effort of any one man. I can assure you that none of the things I have herein mentioned as having been accomplished has been brought about by individual effort alone, but by a union of thought and effort brought about by the exchange of ideas among the members of our board of directors and at conventions such as this. If it be true, that there is yet room for improvement in the production of our dairy products, would it be wise to bring about the extinction of this and kindred associations? I think not.

I assure you that in the future as in the past I shall in my place on the floor of the House at Toronto give special attention to all legislation, which will in any way affect your interests, and I shall do all in my power to further the interests of dairying in all its branches, but my efforts in your behalf would be much weakened were it not for the fact that the Eastern Ontario Dairymen's Association, as an organized body, is behind me.

As I shall preside over the various sessions of this Convention, and will have opportunities of saying something further, from time to time, if necessary I shall not prolong these opening remarks; but before closing, I want on behalf of myself and this Association to thank the Hon. Nelson Monteith (recently resigned) for his extreme kindness and liberality to us during his term of office as Minister of Agriculture, and to extend a welcome to the Hon. James S. Duff, the new Minister, who has recently accepted the position. I feel sure from personal knowledge that the cause of the dairymen of this Province will not suffer at the hands of the new Minister of Agriculture and I am pleased to know he will be with us and address us on this occasion.

I also wish on behalf of the Association to tender thanks to the Hon. Sydney Fisher, at Ottawa, and the Dairy Commissioner, J. A. Ruddick, for the valuable assistance we have received from them in various ways; and as President of this Association speaking to the dairymen of Grenville, I would be ungrateful did I not acknowledge the assistance and co-operation invariably received at Toronto from your talented representive, G. H. Ferguson, M.P.P., in my humble efforts to promote through the Government the interests of the farmers and dairymen of Eastern Ontario. We expect to have all these gentlemen with us as well as many others whose names are well known to you to address the several meetings, and I sincerely hope every effort

will be put forth by those who attend to co-operate in making this Convention a success.

The CHAIRMAN: The address your President has just given is very interesting, and I am sure the result of this Convention is going to be of great use to the farmers of this section.

We are glad to welcome you here, and I have much pleasure in asking our good old friend, Senator Derbyshire, to give a short address. We all like to see him here. I remember the first dairy meeting that I ever attended was in this hall, and the speech that I heard from Senator Derbyshire at that time, I thought was very interesting, and one that every farmer in the Dominion of Canada should hear. I certainly gained a great deal of information that was useful to me in my little way of farming.

THE DAIRY OUTLOOK IN EASTERN ONTARIO.

BY SENATOR D. DERBYSHIRE, BROCKVILLE.

I am delighted, Mr. Chairman, to see you occupying the position of chairman and identifying yourself with the dairymen of this great old County of Grenville. It is a great honour for you to represent this particular part of the country in the Dominion House, representing as you do some of the live Canadian dairymen of this section, as good as there are anywhere in the Dominion.

We feel proud of what we have been able to accomplish in this Eastern section, and although the exports are not as much as we would like to see them, yet we have the satisfaction of knowing that in this district we have sold this year $3,000,000 worth of cheese. Not only that, but we have supplied the local market with a large quantity of butter and cheese. I am delighted to be in Prescott, because I have looked forward with a great deal of pleasure to meeting here. I would have liked to have had the meeting in Brockville, but the Prescott men were determined to have the meeting here, and, from the reception we have received, I am delighted we accepted the situation.

Last night's reception of the committee was the best we have ever had in the Dominion. You have right in your town an institution that many of the people do not know about. You have a creamery that is making fancy butter, and I am proud to see that it is extending from year to year. I find that in 1906, when they started that the milk delivery was valued at $11,220.18, and that is quite a large sum for the opening of a large institution with cheese factories in the immediate vicinity. In 1907, it was $11,757, and although this last year has been a trying one, in 1908 it amounted to $17,740—that is money paid out for milk delivered here, and I think it is a big record, for it is an increase of over $6,000. I can testify that the butter is fancy and of the finest quality.

I would like to congratulate our President on the able address he has just delivered. If there is any man who has served this Association well, it is John R. Dargavel, and he has served us well from the time that I appointed him treasurer *pro tem*, on the death of our old esteemed treasurer, Mr. Daly. I knew he would do the business right. I knew we would have a large deficit that year, and I though it best to have a good man to pay out the money even if he had to raise $2,300 on his own account. (Laughter.) Of course, that was a small matter with him, but with some treasurers it would interfere with their business. He helped us at that time, when we were hard up, and we

feel proud of the work he has done ever since. We had a selfish idea in making him the President. There was not a Minister of Agriculture that ever occupied the position that could argue for one minute why school children have free education and why the farmer should not have free education. I remember meeting Mr. Dryden, the Minister of Agriculture, and Mr. Ross, and they said, "We cannot afford to grant that money," and I admit it was a large sum at that stage. Then we elected Mr. Dargavel, President, and he went to Toronto, backed up by a committee of this Association, and waited upon the Minister, and they presented our claims for free education, and you all know that we got a grant from the Government of $4,000; and then we raised $12,000 ourselves and we hired instructors and paid them. When we had Mr. Dargavel on the floor of the House of Parliament, and with the Provincial Treasurer representing one of the dairy sections, we were granted $15,000 to give us free education, and that has lifted the dairy business straight up, and done more for it than anything we have had. We feel proud of the work Mr. Dargavel has done, not only this last year, but in the years that have gone before.

I was very glad that our President mentioned our good friend, the Hon. Mr. Monteith, because it was he who assumed the responsibility and presented this matter before the House and carried it through, and although he was defeated in the last election, and is not Minister of Agriculture to-day, I think it is only fair and proper that we should remember his name as one who has assisted the Eastern Dairymen and the agriculturists of Ontario possibly more than any one of the previous Ministers. We look forward to the new Minister being a practical man.

At one of our district meetings at Belleville, we had a large attendance, and they tendered us a banquet at the Quinte Hotel, and it was the best banquet I have had the pleasure of attending for many years. The new Minister of Agriculture, Hon. Mr. Duff was there, and his address had the right ring in it, and with our President on the floor of the House, I believe we will be able to show him the claims of the dairymen, and we have the best hopes that Mr. Duff will follow in Mr. Monteith's footsteps.

We are proud of the Deputy Minister of Agriculture, Mr. James. He has always been ready to assist and co-operate with the Eastern Dairymen, and we are glad he is going to be with us and assist us in the years to come, and Mr. Putnam, who has charge of Dairy Education and Farmer's Institutes has helped us all he possibly could, and we feel very thankful to him for the service rendered.

The greatest man connected with dairying in Eastern Ontario to my mind is Mr. Publow, Superintendent of the Kingston Dairy School. He has devoted his services enthusiastically to the dairymen of Eastern Ontario, and there is no man who deserves greater credit than Mr. Publow in connection with extending the business of dairying in Eastern Ontario. He has had charge of the twenty-four instructors, and is an authority in connection with this business in the Dominion of Canada and the United States. During the course of this year we felt very shaky about Mr. Publow. He was offered a great deal more money than we have been able to pay him, but with the influence of the President and the directors, we have been able to induce him to stay here until he sees his work perfected, and we feel proud that he accepted our suggestion.

Where cheesemakers attend the dairy schools at Kingston, we notice their cheese are cleaner and more uniform in size, and have better finish and are put up in better shape on account of the attention they receive at that institution.

The Dominion Government has done every thing they have been asked. They have improved the cold storage facilities, have given us a larger number and a better system of refrigerator cars on the railroads, and they have increased the number of ships leaving Montreal with cold storage facilities, and thus we have been able to deliver our goods on the British market in better condition than we ever did before, and we feel proud of what we have been able to do. They have better cold storage facilities on the docks on the other side. We remember very well when the butter was spoiled on the docks in the old Land by being allowed to stand, in some cases, three or four days in the sun. But to-day things are different. This has been brought about by the Dominion Government in sending men to the other side to watch the goods on arrival and take the temperature of the cold storage department on the ships, and the temperature of the produce, and report to the Dairy Commissioner. We have men in Montreal to watch the temperature of the cars to see that the goods are delivered on the railways in proper shape, and we feel thankful to the Minister of Agriculture for helping us in this way.

Everyone knows we have a fast friend in Mr. Ruddick, who has been an advocate of advanced dairying and cold storage for a good many years, and who has given valuable assistance to the dairymen of the Dominion in connection with this work.

He has visited the various centres of the world and kept in touch with dairying, and in this country has been able to give us very valuable assistance.

Mr. Whitley, one of the members of the Dairymen's Commissioner's staff, has rendered valuable services, and the great wonder to me has been that people have not taken the advantage of cow testing that is furnished free by a man who understands his business. I am sure that as the people find out the importance of the work he is carrying on they will avail themselves of these testing associations.

We also have with us Mr. Barr, one of the Commissioners under Mr. Ruddick, and his services have been invaluable. He has been making the test in different sections of Eastern Ontario and throughout the Dominion, finding out all he could about moisture and temperature and seeing that there was something that could be given to the dairymen that would be a benefit to them.

These men have all been at our command, and we have taken advantage of that fact, and we feel sure that the dairymen of Eastern Ontario are in better shape than they ever were before.

Twenty meetings were held under the direction of the Eastern Dairymen's Association during the past year and they were all largely attended. At the meeting held in the city of Belleville, over 300 sat down to the banquet, and the leading men of the vicinity were there.

One weak point, so far as our judgment is concerned, in connection with our dairy work is the cultivation of the soil in the growing of a larger and better crop, so as to have feed every day of the year to feed our cows in order to make them produce twice the quantity of milk. Give the cow plenty of good feed and plenty of water.

Our weakest point is the man on the farm. Why should so much money be paid out for feed when we have the best dairy section in Canada? We ought to grow plenty of feed to take care of the cows. Over $300,000 was paid out in Leeds and Grenville for feed for cattle; that ought to have been grown on the farm, and then we would have $300,000 more money in this County. The same thing occurred in the Kingston district and the Belleville District. We never raised as much corn before, as we did this year in our county, and it looks as if we are going to be able to produce milk at

less cost; but we must get the farmers to cultivate the soil more intensely and to raise twice the feed they are raising, and to feed the cows every day and never let them go hungry.

Never in the history of Canada has milk been worth more than it is to day. Why do not they milk the cows ten months in the year? The City of Toronto is sending fifty and sixty miles for milk, and when they become better acquainted with milk it will be consumed more largely. We took some pains, through Mr. Ruddick's department, to get some figures, and we find that the exports of butter, cheese, and bacon last year was $46,500,000. These goods were sent out of Canada and the money received here, and $53,500,000 worth of produce was consumed in this country.

With the large population coming into Canada, there is no doubt that the consumption of milk will be larger from year to year. We must have better cows, better stables and keep them scrupulously clean. See that your factory is properly fitted up, see that they have ice, and see that you have ice on every farm for the purpose of keeping the milk cool. You can make ice bricks on your own farms by putting the water in pans and letting it freeze. Every factory ought to have a store of ice in order to keep the temperature right. We are anxious that you should co-operate with us in placing this dairy business on a higher plane.

COMMITTEES.

The following committees were then appointed:

Resolutions: R. G. Murphy, T. A. Thompson and J. H. Singleton.

Legislation: John McGregor, G. G. Publow, R. G. Murphy, Senator Derbyshire and J. R. Dargavel, M.P.P.

Nominations: James Whitton, Senator Derbyshire, and Henry Glendenning.

Business: J. A. Anderson, W. J. Paul, M.P.P., J. H. Singleton, T. A. Thompson, and E. Kidd.

ADDRESSES OF WELCOME.

Mr. Louis H. Daniels, Mayor of Prescott, gave a most hearty welcome to the members composing the Convention. He then went on to say:

I assure you it affords me much pleasure to have the honor of speaking to you for a moment or two on this broad subject upon which we have been called together, a subject of greater importance than any other industry in Canada, that of the science and production of making butter and cheese. It equals in value any other product in Canada, and I think much excels the wheat from the great Northwest. It was my good fortune to be a visitor at the Centennial Fair held in Philadelphia in 1876, and I think, Mr. President, you were there also. Canada made a great exhibit of her products at that fair. However, it was not there that Canada derived her great fame as a butter and cheese producing country, but when we reached the World's Fair in Chicago and we showed that great cheese which was presented to the people of the world and which was made in Canada, and within fifty miles of our town, weighing one ton. It was a great advertisement for Canada. (Applause). I had the pleasure of sampling it, and it was the very best cheese, and it was then that the mantle of glory was lifted, and Canada was

proclaimed one of the greatest butter and cheese producing countries in the world. I could talk along lines of butter and cheese making and the bringing to perfection of that famous animal, the cow, but it is not necessary, because we have on the platform gentlemen who are versed in these matters and can explain the matter more accurately than I can. Allow me to extend the right hand of fellowship to each and every one of you on behalf of the citizens of Prescott, and we will try to make you all feel at home and as happy as we know how.

Mr. W. P. McCarthy, President of the Board of Trade: On behalf of the Board of Trade of the town of Prescott, we extend you a cordial welcome to our town. The members of the Board of Trade enjoy more benefit from the Dairymen's Association than do any other branch of the citizens of the town. The sum of $3,000,000 has been left in the counties of Grenville and Leeds during the past year for dairy productions. The business people of this town, and of the town of Brockville, have enjoyed the biggest part of that, and we hope your thirty-second Convention will be the greatest you have ever held in Canada, and that the benefits derived will be of great advantage not only to the dairyman but to the country at large.

The dairying industry is the greatest we have in Canada to-day. Every cent derived from it is spent in the country. The railroads and the great industrial bodies go to the Old Country to borrow money, and this has to be repaid in due time. But the dairymen sends cheese over there and brings back to Canada money that is spent here, and that will never have to go back. We find a great many Americans coming over here asking for good old Canadian cheese, for the quality of Canadian cheese is the best in America. Our reputation has always been sustained, and we hope that it always will be the case. We trust that your visit here will be a pleasant one and of advantage, and will add to your prosperity next year. This is your first visit to our town, and we hope it will not be your last.

Senator Derbyshire, in his most genial manner, made a suitable reply to the kind words of welcome.

THE WORK OF THE COW TESTING ASSOCIATIONS.

Mr. C. F. Whitley, of the Dairy Division, Ottawa, gave an address on the above subject, similar to that appearing in the report of the Western *Dairymen's Association.*

Mr. Derbyshire: I went to a factory and attended their oyster supper. After it was over I looked over their books. I went to the man that had the best yield per cow in the factory, and then I got the second best man. Finally I went to the smallest man in the factory, and asked him what his ideas were. He was getting only $16 or $17 per cow, and I said to him: "How is business this year?" He said, "We are getting fine prices." The blessed fellow was not getting enough to pay for the feed of his cows, yet he was happy on account of the price being high. We put these three men's names on the black-board; one was getting $67 per cow, the other $40 and the other $17, and that was a lesson for the people of that district. We must weed out the poor unprofitable cows and keep good ones, and the only way to do it is by weighing and testing their milk. This address Mr. Whitley has given us is a most important one, and I hope it will sink into the hearts of all here and that you will put it into operation.

The CHAIRMAN: I would like to relate a little experience I had in a factory I was running, because it bears out exactly what Mr. Whitley has said. None of the patrons were feeding their cattle anything extra, and they were not buying any feed, therefore that could not be urged as a reason why one patron was getting a larger return than another. I quietly found out from each patron how many cows they had. I got correct figures in every instance. I got the man who had the best average per cow in that factory. It was not very large, it was only about 4,000 pounds. Then I went to work and made the calculation as to how much more each one of the other patrons would have received if they had sent even as much per cow as the largest sender, and I found that some would have received $10 more, others $30, $40 and as high as $100 and $200 more, until it ran up to one man who would have got $400 more that season out of that factory if he had obtained as much per cow as the largest. I submitted these figures to the patrons and they were all pretty mad; they didn't like it a bit. It should have been a useful lesson to them, and I think it would be to other patrons in this Province. I think we should point out to them how much more they would receive if they only came up to the best man in the factory.

A MEMBER: Mr. Whitley spoke of a herd of cows that gave somewhere like 4,000 pounds per head in two years, then they afterwards gave 6,000 pounds per head, and he said that was done through the work of the Cow Testing Association. I would like to ask how it was done. It could not be done by breeding in two years, and it must have been done by feeding, if the man kept the same number of cows.

Mr. WHITLEY: As Prof. Dean has often said, it is a question of feeding, weeding and breeding. The average is very quickly raised if the ones at the low end are got rid of. You will find it in the columns of nearly every agricultural pamphlet every week, "Get rid of the small producing cows, and feed the others a little better."

A MEMBER: Did he keep up the number of his herd?

Mr. WHITLEY: I am not sure on that point.

A MEMBER: A man may get rid of his poor cows and milk fewer cows, and keep them better, and make just as much money and have greater profit.

Mr. WHITLEY: That man has done it and so have scores of others. I had a case were a man doubled his yield by better feeding; he doubled his production with the same cows.

A MEMBER: Where did these Cow Testing Associations originate? Did they spring from our Dairymen's Associations?

Mr. WHITLEY: The first one in Canada was organized in Cowansville, Quebec, and the first one in Ontario was in Senator Derbyshire's own district, Brockville.

A MEMBER: If the Dairymen's Associations brought this about, I think it is a good thing for the country. The man in my factory who is sending the most milk is the man that is weighing his milk from each cow, and trying to find out what each cow is giving.

PROBLEMS OF DAIRYING.

BY G. A. PUTMAN, DIRECTOR OF DAIRYING, TORONTO.

It may be that some of you can judge from the subject which has been announced for me that my intention is to bring trouble before you. I think you will all admit that dairymen have troubles of their own, and that per-

haps it is not necessary for us to point them out. We are not here to-day to seek for further trouble, but to draw attention to some of the conditions which we find in Ontario. These conditions have been forcibly impressed upon me in my work of Dairy Director, and Superintendent of Farmers' Institutes, and it is my purpose to lay before you in rather an informal way some of the conditions which we find and to point out, if possible, some of the more important needs of the industry.

I suppose we can mention some problems and troubles which are not evident to the great body of dairymen, but we will mention only those which are apparent to all of us. I think we will all admit there has been progress all along the line in dairying matters during the past three or four years. Our oldest organization for giving information to the farmers is our Farmers' Institutes. We are now sending men to attend factory meetings, and in that way we have reached a great many farmers that we could not get hold of through the Institute meetings We are glad that they have shown appreciation of the work of the Department, and of the Association, in sending out speakers to these annual meetings. We would like to impress upon farmers the necessity of coming together at the annual meetings, discussing problems, and dealing with local conditions in a business like way. We think it is well for you to have the sub-conventions to deal with the problems of different localities, and this has been done very effectively. Last year we distributed 60,000 leaflets on the care of milk, and we have sent instructors to the factories, whose duty it was to help the factory men in methods of manufacturing. We have also sent out literature to the different makers in the Province. These things have resulted in better sanitary conditions, which, after all, is the underlying necessity in connection with dairying. A number of factories have been induced to make better provision for the cool-curing of their cheese. Farmers also, are growing a larger amount of fodder for their cattle, and endeavouring to maintain the flow of milk throughout the season, and they have also been induced to take better care of their milk. The chief instructor informs me that there has been more progress in the proper care of milk during the past two or three years than in the previous eight or ten years, and the makers are better equipped, even though they have not gone to the dairy schools in such large numbers as they should.

The farmer has the trouble of production to face. In some localities of Eastern Ontario the average production per cow is about 2,500 pounds of milk during the factory season. That means that the average production is hardly above the profit point, and it also means that a great many of the cows are being kept at a direct loss to the farmer. We have a great many good cows that are producing a large flow of milk, but we have so many poor producers that it is a question that should receive the immediate attention of the farming community.

In a certain district in the Province there were ten herds of cattle. One of these herds was making a certain profit, and the other nine were making a certain profit, but the one herd was making more profit than the other nine put together; in fact, one man was making as much money out of his eight cows as the other nine were making out of their seventy-two. The farmers seem to forget that it is profit they are working for and not gross returns. Of course the nine men were receiving more money, but they were only making the same profit from their seventy-two cows as the one man was making from his eight cows. That is a matter in which you must work out your own salvation.

The proprietors of factories certainly have a difficult problem to solve. There are so many small factories in Eastern Ontario that the dairy industry can never be placed on a business basis until some method is adopted by which these small factories can be wiped out and larger factories erected. The factory that can afford to pay a maker a reasonable wage so as to induce bright men to enter the business is going to be the most benefit to this industry; and if the manufacturers are going to work upon a business basis they must have good makers, and they must have conditions that will induce the right sort of men to enter the business. We must get rid of the idea of looking on the profit for one year, and we must establish the business on a permanent basis.

The makers also have problems to solve, and the cheese-making profession must be given a higher standing than it has to-day, and that rests with the makers themselves. If the makers properly equip themselves for the work they can demand and they can get a fair remuneration for the energy they put into their work. If permanency is to be given to the industry, we must have united action on the part of the proprietor, the maker and the producer. What is the necessity of the one makes for the advancement of the other, and where you find them all working together, there you will find the greatest progress being made. We must put up buildings which mean permanency. We believe the time has come when the farmers should make a greater effort to help themselves. An isolated meeting in a district once a year does not result in very much good to the dairymen of that community, and I would appeal to you to form some sort of a local organization, call them what you may—local dairy associations or institutes or clubs. Get together, and discuss your own local conditions, and make a study of the literature which is sent to you by the Department, and the excellent agricultural papers that you receive. The Department has just issued a little booklet on the formation of these local clubs. We give you some general directions, and leave it to the good sense of the men in the locality to work it out. Already we have 100 of these local organizations, which are holding monthly meetings for the discussion of problems of interest. You know the success that has attended efforts of this kind in connection with fruit, and we hope the dairymen will look upon their industry from a broad standpoint. I can assure you that the Department will continue the assistance it has been so liberally giving you in the past, and if there is anything that I can do, or Mr. Publow can do, we will be only too glad to help you. I do not think the Department has turned down a call for assistance in any locality; we are always ready to give you assistance.

WINTER DAIRYING.

By Henry Glendenning, Manilla.

The subject I am down for is Winter Dairying, but I do not intend to confine my remarks solely to that side of the question. The first objection to Winter Dairying that will be raised will be with regard to labor. Farmers find it difficult to get men to milk in the winter season, but I do not believe the difficulty is nearly so great as the average farmer thinks. At the present time in Eastern Ontario the great difficulty is with the men who are hired for only six or seven months. These men receive a wage that is nearly equal to that of the man hired for the full twelve months.

In the first place, if your man is a first class one he will look for some other employment during the balance of the year and he goes to the city or the lumber camp or the mining camp, and in that way the best men are often lost to the farming community. If he had hired with the farmer for the whole year the chances are he would continue year after year with the same man. It is an advantage to the man to engage with a farmer for the year because he gets a warm comfortable home, he is at very little expense except for his clothes, and he generally starts out each year with an addition to his bank account, while the man who is hired for a few months usually commences each year at the same place. I do not believe in working unless I have a profit out of my work. In those sections where they carry on dairying the year round you will find the cows are giving a larger flow of milk in the summer months than those which are milking only in the summer. A good many farmers think a cow should get a long rest, and from the time she goes dry she is allowed to run upon a very low ration, and instead of fleshing up her flesh goes down and her bones come up, and she goes out in the spring in a low condition, and no cow of that kind ever made a great record, and it will take several months of the best part of the season after she goes on the grass to get that cow in anything like fair condition for the production of milk, and by the time she has got into good condition the best of the pastures are gone and it is never known what that cow could do.

How did that cow do so remarkably well that Mr. Whitley told us produced 10,000 pounds of milk? I do not know the man, but I know how he did it. He fed that cow. She was fed during the time she was dry as well as when she was milking. If the cow is in high condition she is in a position to develop her organs; she develops a large udder and milk veins, and where cows are milked for ten months you will find them flesh up during the two months they are dry.

Under what conditions does the cow produce milk and make a profit? When she is turned out on the grass she has sunshine and abundance of fresh water, succulent food with the proper nutrients in it for the production of milk. She cleans herself off and casts her hair, and under these conditions we find the cow does best.

Now, we have just to carry these conditions into the stable. We must provide our cows with warm, comfortable, well-ventilated quarters with plenty of sunlight streaming into the stables, with plenty of water and with food that is similar to what they get in the grass fields. It should be bulky, succulent, and palatable, and contain the proper nutrients and at the same time it must be cheap. We have had this season an abundant crop of corn, and in a great many sections it has been properly saved; but the man who depends entirely upon corn for the production of milk is not likely to produce very much milk. We want her to be a consumer of a large quantity of food. It requires about two-thirds of all the food that we feed our animals to maintain them, and the profit lies in the extra food we get them to partake of and digest, so it is important to have the cow consume a large amount of food.

There are many cows in this country that are a great deal better than we have any idea of. Sometimes you will hear of a cow that is kept in a village that gives a large amount of milk and some farmer is anxious to buy her, and when they do so she is put into his herd and does not do nearly so well, and then the farmer will often say, "That man in the village got all out of her that was in her." The reason was that she there got the attention or proper feed. We must put the proper nutrients into the cow to

produce milk, and we do not get bulk, succulency and palatability. I have on my chart here a number of the common food stuffs of the country.

Feed.	Dry matter.	Ash	Protein.	Carbo-hydrates.	Fat.	Nutritive ratio.
June Grass, green.	34.9	2.8	3.0	19.8	.8	1: 7.2
Corn silage.......	20.9	1.4	.9	11.3	.7	1:14.4
Mangels	9.1	1.1	1.1	5.4	.1	1: 5.1
Timothy Hay	86.8	4.5	2.8	43.4	1.4	1: 6.7
Red Clover Hay..	84.7	6.6	6.8	35.8	1.7	1: 5.8
White Clover Hay	90.3	8.3	11.5	42.2	1.5	1: 4.0
Wheat Bran......	88.1	5.8	12.2	39.2	2.7	1: 3.7
Oats	89.0	3.0	9.2	47.3	4.2	1: 6.2
Milk...........	12.8	.7	3.6	4.9	3.7	1: 3.8
Alfalfa Hay......	91.6	7.4	11.0	39.6	1.2	1: 3.8

One hundred pounds milk contains about thirteen pounds of dry matter and seventy-eight pounds of water. The most important element in the milk from a commercial standpoint is the fat, but when we look for a high class feed stuff we look for one that contains a high percentage of protein, and corn silage contains only 9-10 of a pound in 100 lbs. of silage. If a cow gave 50 lbs. of milk in a day, and if she used all of the protein in feed for producing that milk, she would require to eat 200 lbs. of corn silage, which would be a physical impossibility. One of the common feeds used by dairymen to supply the protein has been wheat bran.

The principal difficulty I see about bran to-day is the price. Even with the high price of milk and dairy products, I do not think there is much profit in feeding bran at $24 a ton. I would not stand up and advocate your buying wheat bran and then selling the milk for making cheese and butter if you had to pay $24 a ton for the bran. There are certain conditions under which it would pay to give that price, but I am speaking in the ordinary way of producing milk cheaply. Alfalfa hay contains 11 pounds of protein in the 100. It is not quite as good as the wheat bran, but close to it, 11 pounds instead of 12.2. In 20 pounds of alfalfa hay you have as much protein as you have in 18½ pounds of bran.

Under ordinary conditions you can put alfalfa hay into your barns at a cost of $2 per ton, paying for rent and labour. That is where you get three cuttings in the year. We could not do that this year because we only cut it twice. If you feed 20 pounds of alfalfa a day it costs you 2c. and 18½ pounds of bran at $24 would cost you 22 1-5c., a difference of 20c. a day in feeding bran as compared with alfalfa.

I want to give you something that has happened in our own herd. This is not something that has happened in some far distant land, but right at home. One cow dropped her calf on the 1st of January, 1908. This was her second calf, and seven days after that she was put on the test. The food was all weighed out to her, and the milk was weighed, and a sample taken night and morning and put into a bottle, and at the end of the week duplicate tests were made on that bottle of milk. She was fed fifteen pounds of corn silage that cost $2 a ton. We should have fed thirty-five or forty pounds, but our corn was a failure and we didn't have the silage we should have had. She was fed sixty pounds of roots, which cost us four cents a bushel, and she was fed twenty pounds of alfalfa hay at $2 a ton.

Now this cow never ate twenty pounds of hay a day, but that was weighed out to her, and the herdsman said the cows on each side of her could reach it, and they had more or less of the hay. Eighteen pounds was about what she consumed, but it was all charged to her and that made a cost of 7½c. a day to feed the cow. There was a little oat straw cut with the silage but no charge was made for that. She gave 290½ pounds of milk in seven days, or an average of 41½ pounds of milk per day, 11.62 lbs. fat, for which we received net 29c., and we had all of the skim milk at home to feed to the calves or pigs. That realized about 3.37c. The cost of feeding for seven days was 52½c., leaving a profit of $2.84½, less the labor; 100 pounds of 4 per cent. milk cost us 18.07c. The cost of butter, allowing 15 per cent. for over-run, was 4c. a pound. That cow was in high condition when she came in and at her best for giving the large flow, and I would not like you to run away with the idea that all our cows are doing well. She was not the best or the worst cow, but the best at that particular time. No doubt but a large amount of the energy that was stored up during the dry period went into the pail.

I want to give you the result for November last. There are twenty-five cows in the herd, and seventeen of the twenty-five have had their first calf, and they all dropped their calf at the age of two years or a little over, so you see they are too young to make a great record.

Somebody will say, "How do you happen to have so many two year olds?" Last year we found we were going to get more cows around us than we could handle and we sold a number of the older ones. There were some cows that had lost a quarter of the udder and we sold them at auction for what they would bring, and we are starting in practically with a young herd. I had the herdsman weigh out the feed for one day and make a careful computation of the feed those cows received.

This year we had a great crop of corn, and the actual cost of production so far as I could figure it was $1.25 for silage per ton placed in the silo. We feed thirteen ton of corn silage for the thirty days, $16.25; forty pounds of roots at 4c. a bushel, $20.00; twelve pounds of alfalfa hay at $3.00 a ton, $13.60. Your total cost for the month of November would be $49.85.

Some of these cows were nearly dry, three of them went dry in December. All of the butter, cream and milk that was required for a large family was kept at home, and all the skim milk was kept at home for feeding the calves and pigs. We simply took the check we received at the creamery, after the cost of manufacturing, drawing and everything was paid for, and the check was $101.17, leaving a profit after deduction of the cost of feed of $51.42. I find that the feed for the month of November where cows were continually in the stable was a trifle less than $2 a month. I believe we can produce milk quite as cheaply, and that the profits are quite as large, under winter conditions as they are in summer. If our cows had been three or more years older the result would have been much better.

The question will arise, can you in this section grow Alfalfa hay? Any land that is good for growing red clover will produce Alfalfa. It will not do on wet flat lands. The land should be sufficiently rolling to run the water off and it should be clean, and in a good state of cultivation, and you require a good deal of lime in your soil. We sow about twenty pounds of Alfalfa seed to the acre, and when you are growing it for the first time don't fail to get a supply of nitro-culture to apply to the seed. You can get it from the Agricultural College at Guelph. If you have grown Alfalfa before on the same land you do not require the nitro-culture. You should

not pasture your Alfalfa fields. If you do, the cattle and horses will destroy it. Do not cut it late in the fall because it will not grow very fast when the cold weather comes.

Q.—About how late would you cut?

A.—It should be cut the last time in September.

Q.—What do you generally sow it with, oats or barley?

A.—We have had the best results with three pecks of barley to the acre and be sure and sow it in front of the drill.

Q.—How many tons do you cut to the acre?

A.—I consider the average crop from five to six tons per acre when you get three cuttings in the season.

Q.—You say you can pay rent and harvest and seeding and put it in the barn for $2 a ton?

A.—Yes I can give you the figures.

Q.—How often do you feed your cows a day?

A.—Twice; they are fed Alfalfa hay and corn silage and roots and the man throws in some oat straw to them.

Q.—Does your herdsman feed the quantity mentioned of corn silage, Alfalfa and roots at each feed?

A.—No, that is what they get in the day.

Q.—What do you feed first in the morning?

A.—They are fed roots and corn silage in the morning and Alfalfa after, and then after the milking is all done they get the long straw.

Cost of Producing Alfalfa Hay. Now these figures I am going to give you were taken in 1906. It was an eight acre field, rent $4 an acre, the seed is included in that $32. Ten hours for cutting, $3. Nine hours tedding, that tedds the fields twice, $2.25; four and a half hours raking, $1.15; coiling up and turning out coils before bringing them into the barn, $5; four men and two teams hauling one day, $8; one man in the mow, $1.50, a horse and boy on the fork, $1.00; total, $53.90. That is the first cutting. I expect three tons an acre, that is twenty-four tons for the eight acres. For second cutting you have no rent to pay. The cutting and raking is the same price, but there is no coiling up because the crop is not as heavy, and it cures more readily, $11.15 twelve tons. Third cutting and raking is all the same price; two teams and three men with loader, $3; man in the mow, 50c. and a boy, 40c., making $20.30 for that cutting. We cut six tons, making forty-two tons altogether, the total cost being $75.35. That figures out $1.79 a ton. I said $2.00; the other twenty-one cents is put on for incidentals such as rain that would increase the labour in curing the hay.

Q.—What time do you generally make the first cutting?

A.—Generally from the first of June to two weeks later. I cut it just when it is coming into bloom.

Q.—Your land is in a high state of cultivation?

A.—Yes.

Q.—You should take the average farm?

A.—I would not care to give you $4 an acre rent for inferior land. Don't wait until it is in full bloom. Cut when one-tenth of the blossoms are out, or the stalks will become woody, and the leaves will drop off. Remember the leaf is the most important part of the plant.

Q.—Do you use any salt?

A.—I used to, but I would not allow any man to put any salt on hay of any kind. If you salt hay heavily it will always come out of the mow dark, and will be extremely dry and the leaves will drop off.

A MEMBER: I have grown Alfalfa for twenty years, and I live three miles from this town, and I always grow it mixed with red clover and alsike. If it gets musty at all it will be in the red clover or the alsike. I find that the Alfalfa cures easier than red clover or alsilke.

Q.—How many years do you leave that crop in the soil?

A.—Sometimes only three years. I have left it in as long as seven, eight or ten years.

Q.—Does not the Alfalfa crowd out everything else after three or four years?

MR. GLENDENNING: No; red clover won't last more than two or three years.

Q.—How do you break up a field of Alfalfa?

A.—*It is a very hard crop to break up.* The best way to do is to turn your stock into the field in the fall and pasture it off bare. Then allow your colts and horses to run on that field in the fine days in the winter, and every bite they make means a dead plant. Then along about the 10th of May get a narrow-sheared plow and plow up the field, and put it into corn. The biggest crop of corn we ever grew was grown on Alfalfa sod.

MR. HYATT: Last year Mr. Glendinning gave an address on growing Alfalfa in Prince Edward, and last year we sowed three thousand acres, and I would like to ask if he has had any letters from there.

MR. GLENDINNING: I think I have three or four letters from Prince Edward County with regard to that. Mr. Wellington Boulter, one of the leading farmers, wrote and said, "From what you said at Picton I put in ten acres of Alfalfa, and I am delighted with the result, and I would like you to tell me whether I can get good reliable seed so that I can sow thirty acres more next year.

ONTARIO AGRICULTURAL CONDITIONS.

BY C. C. JAMES, DEPUTY MINISTER OF AGRICULTURE, TORONTO.

On rising, Mr. James was presented with a beautiful bouquet. He said: Toward the end of the year when we sit in our office in the Agricultural Department and work away trying to straighten out the affairs of the year and get ready for the new year, we begin to wonder after all whether there is anything in this Agricultural work, and whether we are making any progress. But when we come to the annual convention of the Eastern Dairymen's Association, and see the genial face of the Honorary President, and find that he is as enthusiastic as ever, and see our old friend, Mr. Dargavel still presiding over the meetings, and when we listen to Mr. Glendenning still preaching the gospel of alfalfa, and find such a crowd as we do here this evening listening intently and asking questions, and all apparently with one purpose, that of gaining more knowledge in connection with the great dairy industry, we feel after all that interest in this great question is not dead.

The dairymen of Ontario, and especially the dairymen of Eastern Ontario, appear to be very much alive, and the gathering which you have to-night, which is a compliment I presume, to this Association, shows that the people of Prescott, and those who live in this vicinity have faith in the dairy industry.

On an occasion of this kind in connection with the evening meeting, you don't look for such instructive talks as you had this afternoon. We are not supposed to talk shop, exactly, but are permitted to address ourselves more to a mixed audience such as we have here this evening. It may be permitted, therefore, that I say a little in regard to the general subject of agricultural work. What are we doing? What are we going to do? What is there to be done? What hopes have we that anything or much more can be done in connection with the agricultural industry of this Province? What does it mean to this country or any other country? You are all quite well aware that Canada has been passing through an era of serious conditions. Perhaps you are aware that the great country to the south of us has had to pass through even more serious conditions than we have had. If any of you have been watching the American papers during the last few days, you would notice that just about the New Year, when it was customary for people to look over the past year to see what they had been going through, and to look forward into the New Year to find what hopes there were for the future—you will have noticed that through a great many of these journals there has been running a note of promise. They are looking forward to a prosperous year, and the great thing that has advanced that promise, the great revival of good times, is that during the past year American farmers have produced about seven billion dollars ($7,000,000,000) worth of products. They do not talk about the products of their mines, they do not talk about the products of their forests or the manufacturing establishments, but they all point to that big figure, which is so large that one cannot comprehend it, and they say the American farmers during the past year have produced upon the land seven billion dollars worth of material. Why did they not refer to those other things? Because they know that seven billion dollars worth of product will start the men working in the mines, in the lumber camps, and the great manufacturing establishments of the country. And if it had not been for the seven billion dollars worth produced by the farmers of the United States there would have been very little use to go to the mines, very little use to go to the forests, and the great manufacturing establishments would have to remain closed.

We see the same arguments being advanced, only in a milder type, by the leading papers in this country. They are trying to build up our hopes by saying that during the past year the farmers of the Western Provinces have produced $75,000,000 worth of wheat, and they have produced so many million dollars worth of other material; and the farmers of Ontario have also added materially; so that out of the product of the farms of the country there will be started all the other great industries, and their success will be based largely and primarily upon the work that the farmer first of all has done. And that is why you, in the town of Prescott, and we, who live in the city of Toronto, look for the first indication of prosperity and revival of business, not to the lumber camps, or to the mines, or to the manufacturing establishments. We rather turn our eyes towards the country, and ask, "What are the conditions, and what are the farmers doing?" because they, to a very large extent hold in their hands the key to the great business interests of this country. And so you, as citizens of this town of Prescott, are directly interested in the welfare and progress of the farmers of Eastern Ontario, and it is quite fit and proper that you should come out to meetings of this kind, and that you should, as far as possible, attend meetings held in the daytime, so that you may see what the farmers of this Province are doing, and get in touch with that great industry which lies at the basis of our other great industries in this country.

Is there anything being done to further develop this great industry? Is there anything being done systematically or are we going at this business in a haphazard way?

Talk to the manufacturer and ask him whether the manufacturing industries in this country are being left largely to chance, and he would laugh at you. He would say, "No, our business is systematized and we are studying it from the ground up. We are studying the cost of our material and machinery, and we look for new methods of handling our goods, and for the best workmen we can get. We are drawing the line closely between the cost of production, and we are, from day to day, and week by week, and month by month, looking cartully at every part of our operations, because we know we must study these things carefully and closely."

So, I say, if it is so necessary in connection with our great industrial business, there must be some reason for applying this same close study to this greatest of all industries, the agriculture of Ontario; and for this reason you may well ask as to whether the Eastern Dairymen's Association or the Department of Agriculture, with its allied institutions, is going about its work in a haphazard way, or whether we are trying to work in a systematic manner to build up the Agricultural industry of this country.

I will try to give you in brief a statement of a scheme on which some of us are trying to work out this great industry. Agriculture in its original definition means cultivation of the field. The farmer starts with the soil, and so any connected system carried on, any great undertaking set going for the improvement of an agricultural country, should begin with the foundation. What I am saying in regard to agriculture as a whole should apply to each individual farmer, and the dairymen should apply the same line of reasoning.

First of all, we start with the soil in this country. Those of you who have travelled to other Provinces, and to neighboring states, are well aware that in this Province of Ontario we have a soil which is peculiarly adapted to agricultural work. Now the first question that we as workers ought to ask ourselves is this: "Can we, by any means within our power, assist in the development in that great field of agriculture—that is the soil itself?" The question came up in connection with Mr. Glendenning's paper. The point was raised that he had made his calculation on a field that was a little above the average, and it seems to me the point that was brought out there must have brought home to every person listening a very important point, namely, that the best farming operations can be carried on only on the best soil, or upon soil in its best condition. And so it seems to me that, looking over the Province as a whole, it is the duty of those who are concerned in the great agricultural movement to see that the soils of the Province of Ontario are used to the best advantage to find out in what way can this be accomplished? What movement can be set into operation that will materially improve the soil cultivated in this country?

In the first place, there is a considerable area utterly unadapted to agriculture. Necessarily, when the settlers first came into this Province, which was then covered with forest, they had not then an opportunity to choose, and they had to settle to a large extent, wherever the opportunity presented itself. The result has been that after many of these farms were cleared of their timber, there was left a soil which was entirely unfit for agricultural purposes. You go throughout this country from east to west, and you will find a great many farmers trying to eke out a living on farms that are utterly unadapted to agriculture. What is our duty to-day under those circumstances? Surely it should be in some way or other to advise

with those farmers, and to assist them to get off of these untillable farms where there is very little soil, or from those loose sandy soils, and to encourage them to settle on lands far better adapted to agricultural work.

It may be that in this audience there are men who are confronted with that problem. The soil is not adapted to their work, and so a great many of them are looking to the Western prairie—Manitoba, Alberta and Saskatchewan—attracted by the wonderful development out there. I want to say here that if any of you are at present considering such a proposition as that, we would like to ask you before you make up your minds to leave this Province to go north into our own country, and you will find a land that will surprise you. Three or four hundred miles north of here you get beyond the height of land into a wonderful belt of clay country largely covered at the present time with spruce and other trees, where you can build up for yourself a farm home as fine and as promising as are the majority of the farms here in the southern part of the Province. The people of this country will, one of these days, be very much surprised indeed to find that we have opened up a country in Northern Ontario well adapted for agriculture, and larger in area than the old settled portion of the south.

Then we have considerable areas that have once been covered with forest, but are no longer adapted to agricultural work, having light, loose soil. We have carefully examined the Province in a great many of these sections, and lately there has been inaugurated a Government plan whereby considerable of the areas are being brought back into the possession of the Crown, and we are making of them forest areas and endeavouring to cover them with forests. There are other areas that are of very little use at present, because they are water logged; and that is a matter that every farmer ought to give very careful and close attention to. The reason for drawing particular attention to this is that in nine cases out of ten these are the richest portions of the farm, being unsuited for agriculture at present simply and solely because they contain too large a quantity of water. We have inaugurated during the last year or two a general plan, looking to assist farmers throughout the Province, whereby they can adopt some cheap and simple method of draining these lands and making them productive.

We move up from the soil to its productions. The average production of the farms of this country is larger than it is in some other countries, but, when we compare Ontario with some of the other countries of Europe, England, France, Germany, Belgium and Holland, and parts of Italy, where intensive agriculture has been carried on for a thousand years or more, we must ask ourselves the question, "Why in a country that is only one hundred years old are we unable to produce results that are now being got in these old countries of Europe that have been farmed for a thousand years or more?" It behooves us to settle down and consider whether by any means we can improve the crop production. In connection with the Provincial Department of Agriculture we are trying to do this. We are trying to encourage the farmer to sow better seed. Take one stalk of wheat or oats, and the kernels of grain upon that stalk, and if by any means you can add one grain to each stalk, or if you can multiply the number of stalks, the total for the Province would not be 100,000 bushels, it would be millions. Is it worth working for? Certainly it is. If we can add a few million bushels it means larger crops, more feed for our cattle, and more butter and cheese; and those who know, tell us it is a very simple matter. There is a great difference between 1st class, 2nd class, 3rd or 4th class grain. The individual farmer must look after this on his own farm; the Department cannot do that for him. The Eastern Ontario Dairymen's Association can-

not do it. How is it to be done? All you have to do is to get in touch with our men at Guelph and Ottawa and they will supply you with samples of this improved wheat, oats, or barley, and they will show you how, by selection, you can take that which you are now growing upon your farm and improve it so that you can add 1 per cent., 5 per cent., 10 per cent., 25 per cent., and in fact 50 per cent. to the annual production.

Q.—What are we going to do with these crops? Years ago they were taken to the market; but that day has long gone by, and Ontario is no longer a great grain-producing Province for export. What are we doing with it? We have our barns, our cattle and our sheep and swine; and now instead of putting this wheat and oats and barley into the waggon or sleigh and hauling it to town and selling it for cash, it is fed to the cattle and the hogs and sells as milk, butter, cheese, bacon or beef. If you go into a large manufacturing establishment and ask the proprietor what he is manufacturing, he will tell you such and such a line of goods. "How are you doing it?" By hand? "Oh, no, I have machinery." "I suppose any old machinery will do?" "Bless you, no. I put in the largest and best possible machinery I can get. I put in a new machine last year, and I heard of a better one six months afterwards and replaced it." You say to farmer Brown, "I see you have gone into the manufacturing business?" "Yes, I am growing oats, wheat and barley, and I find I was not only selling wheat and oats and barley, but I was selling the very farm itself, and so I decided I would put in machinery and turn these oats and wheat and barley and alfalfa into a finished product. I decided that I would produce milk." "What kind of a machine have you got? Have you got an up-to-date machine?" "I do not know. It is a cow. That is all I know about it. She eats so much and gives some milk." "Does she do it economically?" "I do not know." You would set down the manufacturer as foolish if he did not know whether the machinery he had in his establishment was making money for him or not, or whether it was paying its way. Every dairy farmer in this country should know whether the machines he is using on his farm are paying him or not. A lot of our most progressive dairymen in the east and west are carefully considering this question, and they are weighing and testing milk and keeping an accurate record, so that they can tell you as to what these living machines in the barn are doing, and whether they are paying or not. The success of this movement rests not with the people of Toronto or Guelph, but it will be settled only upon the separate and individual farms of this country. So I say that every man who comes to this Convention should go away from here and endeavor as far as possible to apply to his own work the principles which these speakers have been trying to teach from this platform.

I sometimes think that we have been emphasizing to too great an extent the money end of the transaction; yet, after all, it is very necessary and important that we should consider this question of dollars and cents. If a farmer cannot make ends meet then he must go out of business. But in the discussion of these agricultural questions from the dollars and cents standpoint we ought to be very careful that we do not lose sight of other great questions which equally concern the farm life of this country. It would be a sorry day for Canada if the farmers got it into their heads that the one sole object of agriculture was to make money. I think you will agree with me the acquisition of money is one of the lowest motives which should actuate a human being.

Let us not forget that there are other great questions in connection with agriculture to which we ought to give equal importance—social life and home

life, for instance. People who live in the country sometimes envy the men who live in the city. Your boys and girls should be of more importance to you than your crops or your cattle. The men of this country have left the solving of that question to the women on the farm, and in connection with our Women's Institute work, these questions have been taken up and discussed; and I thinks perhaps that as an outcome of that Women's Institute movement we shall see inaugurated a new life into the agriculture of this country, and a new social development which will result in brighter farm homes. (Applause.)

This, to my mind, is to-day one of the most important questions facing this country. The life of Ontario depends more upon the condition of the farm life than it does upon the condition of the town and city life. The northwest—Manitoba, Alberta and Saskatchewan—have been draining some of the counties of this Province, until one wonders who can be left to carry on the agricultural work. Our great towns and cities, also have been attracting our boys and girls by the tens-of-thousands; and one of the great questions that confronts us to-day is how we shall keep on the farms of this country a sufficient number of our young men and women, so that we should not have to take their places by raw recruits from across the Atlantic? Ask yourselves whether in the townships in which you live there has not been going on for years the draining of the best blood, the best thought and life out of that county, not simply by the great Northwest, but by our towns and cities. We ought to sit down and give careful consideration to these social, educational and moral questions which after all are of more importance to this country than the making of dollars and cents.

I trust that we, who are directly concerned with the agricultural life of this country will give those in our own homes careful thought, and see whether in addition to improving the soil and crops and stock, we cannot in some way devise some means whereby there shall be a decided improvement in the home life—to add to the social, intellectual and moral quality which is manifested in the rural life of this country, which are in my opinion the greatest assets of the Province of Ontario. (Applause.)

The CHAIRMAN: I have now much pleasure in introducing to you Professor Creelman. We sometimes forget that this Province has that wonderful asset in the Agricultural College at Guelph. I do not think they get as many students from Eastern Ontario as they are intitled to. The Agricultural College is a wonderful asset of the Province of Ontario, and why we in the east do not take more interest in it, I do not know. It is a great loss to the young men in Eastern Ontario, and to the ladies as well. I had the pleasure of visiting that institution a year ago, and I am sure it was a revelation to me to see what I saw there. I could not help but feel sorry that some of our young ladies and young men were not taking advantage of the wonderful facilities of that place.

ADDRESS.

BY GEORGE C. CREELMAN, PRESIDENT OF ONTARIO AGRICULTURE COLLEGE GUELPH.

Mr. Creelman on rising to address the audience, was also presented with a handsome bouquet. He said: It is a great pleasure to me, and a great privilege, to be invited year after year to the Eastern Dairymen's Association of this great Province of Ontario, and to be allowed to sit upon the platform, and stand upon my feet and say something to the intelligent farmers

and townspeople of this Province, in reference to the work which is being done in our College. It is my special privilege to come to you to-night to say something about the conditions existing in this Province as comparing with the existing conditions in agriculture in other parts of the world. It was my privilege this year for the first time to take two or three months off from my business in Guelph, and to go to the Old Land and there have my eyes opened to what was going on in agriculture. We get to think as we travel out to our Northwestern Territorries and see the towns springing up that we are an old people in the Province of Ontario, and can give pointers to the people of these Western towns, and cities; but it takes all the conceit out of one when he starts, as I did, from the City of New York and landed upon the soil in that old country of Italy, where they cultivate 85 per cent. of the land that is devoted to farm work, and raise 510,000,000 bushels of cereals each year, in addition to tobacco and wine. And just before leaving home, I had received the returns from our College dairy herd for the year, and found that one cow in that dairy herd had produced on the farm the year before 20,778 pounds of milk in one year. I was not prepared when I landed in that older civilization to be met within one hundred yards of the wharf by a boy driving a flock of goats from door to door, and supplying the citizens from day to day with milk while you wait. (Laughter and applause). And I was not prepared when I went up into that beautiful country in Northern Italy and examined more carefully into their modes of farming to find people in the fields spading the sod for wheat—not using plows, not using even the slow oxen; but spading their orchards and spading their fields.

You say labour must be cheap. They work for 50 cents a day and board themselves; and in some places even as low as 40 cents and 25 cents a day. But you could not put up with the slowness of the Italian peasant as I saw him working with a spade made in a blacksmith shop, preparing the land for wheat.

I can hardly understand how it could be that land was renting at from seven to twelve dollars an acre: yet people were paying it, using that kind of labor and implements, I said: "How can it be done?" and they said they did not know. I had to dig in for myself and find out what they were doing, and I discovered two things that set me thinking. In the first place by spading they knew just exactly the nature of the soil they were turning over, and they studied it. They knew from long experience just about what treatment that field should get in order to obtain the largest possible returns. The second thing, they actually lived from the first of January to the first of January of the next year upon things that we allow to go to waste—upon the leaks on the ordinary farms in the Province of Ontario.

I do not mean to say the average farmer is wasteful, or has leaks running away with the profits of the farm; but I do say that we work too much land. (Applause.) We say, "I have only seventy-five or one hundred acres, and I believe I could do better if I had a hundred and fifty acres." We do not stop to think the difference between the average and the possible crop in this Province of Ontario is yet over 100 per cent., and we are not working our land nearly as well as it ought to be worked. Mr. James touched upon my text to-night, when he said that the individual is after all the important factor in this work.

There are a few men in this Province to whom we can point with pride, who have steered this old agriculture ship of state to the proud position we now occupy. I refer, first to my predecessor at the Ontario Agricultural College, Dr. James Mills, now on the Dominion Railway Commission. (Applause.) I refer to Senator Derbyshire, and I refer to a man whose name many of you have never heard, a man by the name of James Leask. We hear

of the great lawyers and the great doctors, but we do not hear much of the great stock breeders, who have done so much for this Province. Mr. James Leask had on his own farm without the assistance of anybody, but his own keen insight, taken a young animal and fed it and nursed it. It was then taken to the great National Exhibition of Chicago, and won first prize against all comers on the continent of America. You say that is an accident, I say it is not. That was in 1907; in 1908, he took another beast to Chicago, and it was only after long deliberation that the judges were able to decide between his and the first prize animal.

There are just as great rewards to be made by individuals in agriculture as there are in any of the professions, and the individual has just the same chance for development and success in agriculture as in anything else.

If I were a dairy man in Eastern Ontario, I would rather have my neighbors know that in the year just passed, I had from a given number of cows produced more milk, and sent it to the factory, and secured a larger check than my neighbors, than have it said of me that I was reeve of the township, or warden of the county, or mayor of the city of Toronto; because I would have done it without the assistance of my friends. What we want is not better breeders but better feeders.

When a man gets so fond of his cows that when he is feeding or milking them he is thinking of cow and nothing else, he is likely to make a success. We do too many things mechanically on the farm. Mr. Putman said in some dairy districts they had an average of only 2,500 pounds of milk per cow per season.

Now, when I tell you that we have one cow in our herd that produced 20,778 pounds per season, you will see what I mean when I say the difference between the average and the possible is so great that there is a chance for more individual work.

The next thing I have got to say is we do not want more breeds and varieties, but we want better strains. I do not believe there is a week goes without Prof. Graham or myself getting a letter asking, "What is the best breed of chicken for me to raise?" I do not think they ever get a direct answer to that question.

We have in our flocks hens that every year eat their heads off, and we have come to this conclusion that after careful observation and counting the eggs that each hen lays during the year, we have been able to create flocks that give us the very best results. We have strains of hens that we have developed by securing their eggs and keeping pullets, and then saving their eggs and saving the pullets. We now have a strain where the flock averaged 200 eggs per year. You say "Is that all you have to do—watch the hens lay?" That is all one man has to do one day. But there is another man doing something else. He is counting the kernels in the wheat, and taking the big ones and planting them; and the same with the barley, and oats and rye. C. A. Zavitz does not do anything else, practically, but look after that kind of work. I have not time to tell the results of the work of that man, who has 4,500 men co-operating with him through the Experimental Union spreading this good seed throughout the Province; but the result has been an increase of millions of bushels of grain and roots. The same thing applies to your dairy cattle. If you get a good milking strain you should not let them go, even if you are offered $100 a head.

Not better implements, but the better care of them. As I travel from township to township, and county to county, I see a lot of implements that are not properly cared for. I find that the boys who come to us from the farms of the Province, are not familiar with the implements they use, and during the past year we have an increasing number coming from the Eastern part of

the Province. We take these boys into our implement demonstrating room, and they are allowed to take hold of these implements and take them apart and put them together again, and they become quite handy with a monkey-wrench, and more interested with the machinery than they were before. They are taught how to oil and care for these machines, and make ordinary repairs.

In many of the old countries I found they had very neat looking barns. I was very glad to get home after so many rainy days in the Old Land. It was too cold in Italy to enjoy it, and too hot in France, and too wet in England, and just about right when I landed on the shores of the St. Lawrence. (Applause.) But when I passed up through this country it was rather the exception to find a well appointed farm homestead and painted house, and with vines and flowers about it, and a well ordered barn a proper distance from the house and trees between. These things were rather the exceptions after coming fresh from the Old Land. When you are thinking of building a barn, instead of hiring a carpenter and letting him build it in the old way, build it so that it will be fitted for the business you intend to carry on. A little more money spent in this way would often make things more comfortable on the farm. Every man over forty years of age is entitled to enough money to enable him to mingle with his friends when it is not going to interfere with his business.

It is not so much what we do with our girls, as what we do with the girls we do not get. We take about 300 girls a year, and they are from good homes, and we give them instruction in household duties, teach them to save steps, teach them cooking, sewing and laundry work, so that these three things may not become drudgery to the individual woman who is going to have to do them. Only five per cent. of the women of the Province keep servants; the other 95 per cent. do their own work. Therefore, I say it is important that every girl should be given practical education in these three things. We educate teachers at the Macdonald Institute, so they can go into the schools and teach the girls these things as well as the ordinary public school studies, and I want to appeal to you members of rural communities to secure a better class of teachers. Would not it be better that you should pay $3 more taxes for school purposes in order that your children might get a better education. I have no quarrel with the educational system of this Province. We have a good educational system, but the system has been directed, up to this time, first through the city schools and town schools, *and then into the country, rather than from the country places first—teaching* the boys and girls things that would be so valuable to them in the country homes, and then working from there to the villages and cities. The present day public school teacher is not old enough for the work in hand. She is of her own volition forced along the line of least resistance through the High Schools and gets to be a teacher, so she can earn money to go on through other things, and we accept her and put her into our schools to teach our children. It is not her fault, but I say the rural school trustees *should have the option of selecting experienced teachers, and they should* be willing to pay more for an experienced teacher. The boys and girls in our schools are not taught those things which help them in every business, and I think we should change our method of teaching and give our children more practical instruction.

Dr. Reid, M.P: I think those who originated the idea of the Association coming here are entitled to a great deal of credit. I feel that a great deal of good will arise from this meeting. I claim to be a farmer. I am living on a farm, and do a little in farming business. I had a little experience in feeding hogs, but I was just $5 out at the end of the deal. I went

into the cattle business, and I have six or eight cows, and I followed out the ideas that I got at a meeting in this hall about a year or two ago. I remember hearing a speech from Senator Derbyshire, and I kept the cows on the lines suggested, and I must say that the results are much better than I expected. When I told some people of the results I had from five or six cows, they really did not believe it.

The Governments both at Ottawa and Toronto are anxious to do all they can in the interests of the farmers of this country, but it depends on the farmers in the constituency to give information and advice, so that we can intelligently bring before the Government what is necessary in the interests of the farmers. So far as I am concerned as your representative, and so far as other members of the House of Commons are concerned, it is only a pleasure to take up any matter of interest to the farmers of the community. (Applause.)

ILLUSTRATED LECTURE.

By J. A. Ruddick, Chief Dairy Division, Ottawa.

The lecturer exhibited on the curtain a number of pictures illustrating dairying in different parts of the world, which was much appreciated by the large audience.

THE CARE OF MILK FOR CHEESE-MAKING.

By G. H. Barr, Dairy Division, Ottawa.

For a report of this address see proceedings of The Western Dairy Convention. The following discussion ensued:

Q.—How about the morning's milk?

A.—It was just taken to the factory without any airing or cooling.

Q.—Don't you think it would be better to have cleats under the cans so as to raise it up and let the water get under the bottom?

A.—Yes, I think that would be a good plan.

Q.—You believe you had no gassy curds from the morning's milk?

A.—No, we had no gassy curds.

Q.—How would it do to drop some clean ice right into the milk?

A.—I would not do that; you would be fined for watering the milk.

Q.—If the milk was mixed on the farm with the morning's milk, should not it be cooled to a lower temperature?

A.—Yes, I think you should cool the evening's milk down to at least 65 degrees if you are going to mix it.

Q.—Is it advisable to mix milk?

A.—Not if you can help it.

Q.—Do you empty that water every day?

A.—No.

Q.—How long would you have to pump water?

A.—I can pump enough in about eight minutes.

Q.—How would you hold the cans in place?

A.—The best way is to have cleats to hold them in place.

Q.—Will they rust?

A.—Yes, they will rust; but that can be avoided in a number of ways. Painting the outside of the cans will do it.

Mr. Ruddick: I would like to add a word to what Mr. Barr has said. I am sure you will all agree with me on two points; first, that the work which Mr. Barr has carried out shows most conclusive results. I do not know of any experimental work that I have had anything to do with where the results have been so conclusive as they have in connection with this experiment.

I think you will admit another thing, and that is, that our method of presenting these experiments with lantern slides is the most effective way in which it could be put before you. (Applause.) We intend to follow up that line of work. (Applause.) I would like to tell you how this work came to be undertaken. One member of my staff in the Province of Ontario, attended a meeting and he spoke about the aeration of milk, and advocated not to air it but to cool it. The question was taken up by one of the leading educational institutions and they wrote to my department and said "One of your men was in the Province advocating that the farmer should not air the milk. We advocate the contrary, and we will continue to do so, until we have some reliable authority not to do so." I was rather amused to find that there was not much authority as to whether it should be aired or not, and I came to the conclusion that we should have some reliable authority. Being fortunate enough to have an assistant like Mr. Barr to undertake it, we got the information and you have it to-day, and we intend to carry it along a little further. Next summer we intend to take hold of all the patrons of one factory and have half of them do one thing one day, and the other half do something different, and with two large vats we will be able to find out the yield from the milk in this way. And when we have that, I hope to publish a bulletin on this question in sufficiently large enough numbers to put in the hands of every dairyman in the country.

The Chairman: I would like to suggest to the Dairy Commissioner, that he should publish a bulletin with this statement for this season. I think it is a great pity that every dairyman of Ontario is not here to see these lantern slides. I know it would be impossible to illustrate the views in the bulletin, but I think the bulletin should be published with figures. It is so important that no time should be lost in placing it in the hands of every dairyman in this section.

Mr. Ruddick: I think the results will be pretty generally published in the press. We are taking some pains to have that done.

Mr. Macpherson: I took a great deal of interest in this valuable address, and I cannot let the opportunity pass without making some remarks. There is nothing that affects the reputation of Canadian cheese with regards to quality, or affects the yield more than a gassy curd. If the flavor of our cheese is affected by this fermentation, and if the yield of the milk is affected injuriously by these gassy curds, and if it is possible to discover a means or method whereby they can be overcome, which has been demonstrated so successfully to-day then you strike at the very first principles of success, and you enhance the quality of our cheese, and you enhance the value, because you increase the yield.

There is no doubt so far as my experience goes, that the yield is deteriorated by gassy curds, and it runs very often from 5 to 15 per cent. Makers know that the whey will be quite milky when you have gassy curds on hand, and valuable material will pass off in the whey and be lost to the farmer and the manufacture, and I cannot express myself too strongly on the importance of this new discovery. We have been told that airing was the thing

for producing milk in the very best condition, and we have the fact demonstrated to-day that cooling is all that is essential. All that is needed is to have the milk kept free from foul odors.

REPORT OF INSTRUCTION FOR 1908.

BY G. G. PUBLOW, CHIEF DAIRY INSTRUCTOR, KINGSTON.

It is with pleasure that I present to you my sixth annual report as Chief Dairy Instructor and Sanitary Inspector for Eastern Ontario.

The work of instruction and inspection was carried on in a similar manner to that of last season, the only new feature introduced being the appointment of two official prosecutors, to deal exclusively with cases of adulteration of milk, thus relieving the factorymen of a very unpleasant duty. Rather than individualize the work of each instructor, I have prepared a tabulated statement, showing in a concise form what has been accomplished, together with other interesting information pertaining to each district.

The number of instructors and sanitary inspectors employed was twenty-four for cheese factories and one for creameries. The cheese instructors had 941 factories under their supervision, and the creamery instructor had 28.

1,723 full day visits were given to the cheese factories. Full days were spent when requested by the factorymen, or when it was found necessary to give general instruction in the manufacture of cheese, or to assist in locating the cause of any defects that might exist, and for a general inspection of the milk supply and sanitary conditions. The factories also received 4,852 call visits, the instructors remaining from half an hour to half a day as occasion required. By visiting the factories at short intervals, and spending some time in the curing room with the makers, the instructors are often able to be of as much service in remedying defects in the cheese, as if they had spent the whole day in the factory. We find this particularly true with makers who have a good knowledge of the principles of cheese-making, but who are liable to be confused owing to the varied conditions in which the milk is received. These call visits have proven to be a great factor in keeping the quality of the cheese uniform throughout the different months of the season, and have proven beneficial to the makers in many other respects. They also enable a more frequent sanitary inspection, and this results in the factories and surroundings being kept in a much better condition than they otherwise might be, if inspection were not so frequent. But the work of inspection was not confined solely to the factory conditions. Considerable time was spent in visiting the farms of patrons. 2,481 farms were visited with a view to improving the quality of the milk supply, and from the conditions revealed by these visits, it would appear that much greater attention should be given to this important feature of the work. It was found at many of the places visited that very little attention was given to the sanitary conditions under which the milk was being produced and kept. At many of these places from which milk was being received out of condition, the instructors demonstrated to the patrons how the milk should be cared for during the warm weather. The milk was divided, and one part was cared for simply by dipping and the other part was covered and rapidly cooled by means of water or ice to a temperature ranging from 65 to 70 degrees. When the milk was received at the factory next day and

fermentation tests made, it was found that the portion cooled by water or ice showed about two one-hundredths per cent. less acidity than that which had been only dipped, and invariably the curds produced were much closer and cleaner in flavor, the difference being most marked in cases where the surroundings where the milk was cared for were unsanitary. It is gratifying to be able to report that in practically every case the instructors were well received, and the patrons visited showed a willingness to comply with the suggestions offered; and we believe, as patrons come to realize how very important it is to produce and care for milk under sanitary conditions, and the losses that are sustained due to the lack of these conditions, the sooner will they be improved.

I am pleased to say that on the whole the quality of the milk delivered to the cheese factories this year showed a marked improvement over that of last, and it is quite evident that, as a result of dairy education, the patrons are taking a more intelligent view of the principles involved in he production and care of milk, and we have every confidence that the improvement will be more marked during the coming season.

The number of patrons delivering milk to the cheese factories this year was 36,801, which is some 1,700 less than last season. This decrease is largely due to the fact that many of the patrons found it necessary to dispose of their herds last season on account of the scarcity of fodder.

The number of cows from which milk for cheese-making was obtained was 340,829, and the amount of milk delivered at the cheese factories from said number of cows, for six months beginning May 1st and ending October 31st, was 459,584 tons, 695 lbs., which gives an average of 2,700 lbs. per cow. The highest average in the twenty-four groups was 3,162 lbs., and the lowest, 1,729 lbs.; but it is only fair to say that many of the factories in this syndicate did not open till about the 1st of June and closed the last week of October, so that the low yield in this syndicate is accounted for by the short factory season.

The average percentage of fat in the milk for six months was 3.65 per cent.

From the milk was manufactured 85,809,909 lbs. of cheese, the average amount of milk required to make a pound of cheese being 10.71 lbs. (Here I would like to express my thanks to the officials of the factories who so kindly assisted the instructors in securing the above information).

The testing of milk for adulteration was also conducted by the instructors, 48,226 samples being tested by lactometer and babcock tests, and of this number, 129 gave indications of having been tampered with. In each of these 129 cases, a sample from the herd was obtained, and a thorough investigation made, and as a result, 114 were handed over to be dealt with by the official prosecutors who were engaged by the Eastern Ontario Dairymen's Association. 108 cases were laid before magistrates, and the parties were given an opportunity to plead guilty or otherwise. Convictions were obtained in all cases except one, and fines were imposed on the convicted parties of from $5 to $50, amounting in all to $2,380, one-half of which went to the Eastern Ontario Dairymen's Association and the other half to the factory in which the offence was committed. No settlements outside the the court were allowed, and it is thought that the publicity given in this manner will have a good effect in stamping out the tendency to tamper with milk. It is to be regretted that so many still persist in this work, and it would appear that the only way to prevent it would be to pay for the milk according to quality; but this will evidently not be in effect for some time, as there were only 87 cheese factories paying by test this season. So long

as the pooling system continues, there will probably be no better way of dealing with the matter than the method which was adopted this year.

It is very gratifying to note the continued improvement in the factory buildings and surroundings. There were 29 new factories built, and 490 made improvements in buildings and plant, the estimated expenditure, including new buildings, being $130,695.

In the matter of sanitation of the factories, the greatest problem we had to deal with was the keeping of the whey tanks in a proper condition. It is quite evident that the condition in which many of these tanks are kept is responsible for many of the objectionable flavors that we find in the milk and cheese. As an evidence of this, in some twenty factories that were having trouble with undesirable flavors, we found that after the tanks were thoroughly cleansed, and kept in that condition, the trouble practically ceased, but where the tanks were made of wood and has been in use for a considerable time, it was found most difficult to keep them in a satisfactory condition. In factories where steel tanks were in use very little trouble was experienced in keping them in a sanitary condition, and they are much to be preferred for this reason. In twenty-four other factories where they were having the same difficulties, and where it was practically impossible to thoroughly clean the tanks, they adopted the system of pasteurizing the whey, and wherever this was properly done no further trouble was experienced with bad flavors. Another great advantage of pasteurizing the whey, other than overcoming objectionable flavors, is that there is a more even distribution of the fat in the whey, and it is delivered in a sweeter condition to the farms. I would therefore strongly advise the patrons, where the whey is returned to the farms in the cans in which the milk was delivered to the factories, to seen that the tanks are regularly cleaned or that the whey is pasteurized.

While the majority of the factorymen responded quite readily to the recommendations made by the instructors, yet some twenty-five persisted in keeping their factories in a very unsanitary condition, until they were instructed that unless they made the necessary improvements at once action would be taken against them; but I am pleased to say that we obtained the conditions asked for without having to resort to this measure. To be fair to the factorymen, I might say that it was not because they did not see the necessity for the improvement asked for, but owing to their small patronage and the low price of manufacture, there was little or no profit in their business; in fact some of them did not have enough to pay the running expenses. It is to be regretted that in this eastern section there are so many small factories that this will apply to, and I would strongly advise that wherever possible two or three be combined and a good up-to-date factory built in their stead. With the exception of one or two districts, the majority of the factories are now in good condition as far as the buildings and drainage are concerned. However, the great majority of them are lacking in good facilities for curing the cheese, as only 49 are so equipped as to be able to maintain a uniform temperature in the curing room throughout the season, which is so essential for the proper curing of the cheese. During the hot weather where there are no facilities for controlling the temperature, heavy losses are often sustained through the deterioration and shrinkage of the cheese in the curing rooms, and besides there is not the independence of market conditions that is possessed by factories equipped with cool-curing rooms, and I believe the lack of these conditions is often responsible for the shipping of cheese so close to the hoops.

Regarding the manufacture of butter from the whey, I have to report that there were some 63 factories engaged in it this season, as compared with 14 last season. The yield showed a variation of from 3 to 8 lbs. per ton, the increased yield being obtained when the milk was received in an over-ripe condition and was being delivered every other day. While it is evident that with proper facilities and care in the manufacture good butter for immediate use can be made, yet I am still of the opinion that where the *milk is delivered to the factories in a cool, sweet condition and skilfully* handled in the manufacture, it will not pay for factories to adopt the practice unless the output is large.

Perhaps the most important branch of our work, and the one upon which our success mostly depends, is the quality of the cheese; and while there are quite a number of cheese being manufactured that can be classed as second grade, yet it is gratifying to be able to say that there is a gradual and decided improvement in the average quality, and notwithstanding the critical inspection this year there was a marked decrease in the number of claims.

Here I would like to commend the Montreal merchants for the fair manner in which they treated the factorymen in this respect. Very seldom were whole consignments faulted, but in several cases where whole shipments were objected to, it was found that a few cheese were responsible for *the claims made, and if factorymen would adopt the plan of numbering the* boxes of defective cheese, and acquaint the buyer of the same, it would result in the docking of only the cheese that are deserving, thus preventing much confusion and dissatisfaction. Here I would like to thank Mr. Burgess, the official referee, for the prompt and efficient manner in which he reported on the defective lots he was called upon to examine, which enabled me to immediately acquaint the instructors with the existing defects, so that they were able to give prompt assistance to the makers who were in difficulty.

The defects that were most common in the defective cheese were openness in make, coarseness of texture, and flavor not clean. Very few complaints were made regarding the finish and boxing of the cheese. The improvement in this respect has been very marked, and while the majority of the makers are capable and are doing good work, yet there are quite a number who are indifferent and lacking in ability and experience. Of the 941 who were in charge of the factories this year, only 301 have received any dairy school training, and of this number only 75 hold certificates or diplomas from any of our dairy schools.

I would strongly recommend the cheese and butter makers to take at least a short term in one of the dairy schools each year, and thus take advantage of the opportunities afforded by the Department of Agriculture, of getting a knowledge of the scientific principles of dairying, of which it is so essential they should be possessed to enable them to deal successfully with the dairy problems with which they are being continually confronted.

Regarding the instructors, I would like to express my appreciation of the manner in which they performed the duties allotted to them. They have put forth their best efforts to bring about improvements in their respective districts, and as a result, more substantial improvements that will tend to the uplifting of the dairy industry have been made in 1908 than in any previous year.

Before closing I would like to express my appreciation of the ready assistance that the directors of this Association have at all times given to the instructors and myself in our efforts to improve the quality of our dairy products and the conditions surrounding their manufacture.

Syndicate.	No. of factories in your group.	No. of full day visits given.	No. of call visits given.	No. of patrons.	No. of patrons visited.	No. of cows from which milk for cheese making was obtained.	Average yield of milk per cow for season.	Average percentage of fat in milk from May 1st to Nov. 1st.	No. of lbs. of cheese made from May 1st to Nov. 1st.	No. of fermentation tests made.	No. of tests for adulteration.	No. of samples adulterated.	No. of factory meetings attended.	No. of factories which pasterized the whey.	No. of factories manufacturing whey butter.	No. of factories paying by test.	No of curing rooms in which the temperature can be controlled.	No. of new factories built.	No. of factories which made improvements in the buildings or plant.	Estimated expenditure for improvements, including new buildings.
Alexandria........	37	60	150	1,020	20	10,145	2,557	3.70	2,501,975	111	927	2	1	....	....	3	......	1	15	$3,260
Almonte..........	41	87	131	1,752	119	15,356	2,317	3.72	3,244,094	308	1,885	3	9	2	....	2	......	1	40	8,500
Belleville.........	40	94	136	1,967	106	17,723	3,051	3.69	5,012,803	70	5,461	5	4	1	....	....	6	1	8	6,200
Brockville, E......	45	87	246	1,774	47	18,099	2,853	3.54	4,694,222	67	1,539	1	4	8	7	1	1	8	35	21,697
Brockville, N......	44	77	224	1,094	65	14,927	2,800	3.65	3,799,690	98	1,365	....	....	....	2	....	1	3	15	7,450
Brockville, W......	42	84	207	1,034	105	14,530	3,104	3.62	4,125,881	268	2,079	5	....	....	1	4	3	....	42	7,360
Campbellford......	39	79	200	1,623	65	16,295	3,162	3.50	4,644,604	156	3,400	9	11	....	1	....	3	1	21	6,175
Chesterville.......	37	42	364	1,130	32	11,180	2,830	3.50	2,801,779	54	888	1	2	2	3	12	1	....	30	4,000
Cornwall.........	36	60	238	1,500	100	13,008	2,625	3.95	3,480,730	100	1,164	15	....	1	1	15	1	2	30	6,680
Finch............	38	71	146	1,209	204	11,534	3,014	3.55	3,210,967	96	1,396	6	20	....	2	....	2	1	11	2,925
Kemptville.......	42	107	216	1,643	169	15,637	2,540	3.65	3,652,468	49	1,731	6	15	....	3	9	......	1	23	6,468
Kingston.........	38	100	139	1,308	67	13,598	2,768	3.55	3,465,509	69	2,975	10	....	1	2	....	......	2	3	3,600
Lindsay..........	31	40	163	1,710	79	11,829	2,413	3.67	2,605,508	47	1,790	1	11	....	2	4	......	1	10	3,000
Madoc...........	36	90	109	1,017	115	10,449	2,304	3.83	2,266,359	162	540	6	9	....	....	....	2	....	12	2,300
Morrisburg........	40	68	220	1,247	110	12,470	2,751	3.51	3,402,626	330	1,210	7	4	5	11	3	......	....	15	1,500
Napanee..........	40	68	178	3,003	95	25,525	2,818	3.65	6,829,632	120	5,750	7	3	....	....	....	3	....	20	2,300
Ottawa...........	39	77	148	995	11	10,369	2,372	3.52	2,300,354	141	1,236	3	3	....	4	8	......	3	15	8,805
Ottawa, E.........	38	92	190	1,175	50	11,838	2,505	3.85	2,869,865	75	2,300	4	5	3	4	9	......	....	25	2,052
Ottawa, W........	37	45	207	1,700	300	14,225	1,729	3.57	2,320,000	301	1,200	7	3	....	1	3	5	1	30	6,526
Perth............	38	39	185	1,611	105	11,165	2,678	3.70	2,795,495	119	832	2	6	1	3	....	......	2	12	3,565
Peterboro.........	34	60	330	1,653	501	12,617	2,804	3.54	3,198,963	24	1,729	9	12	....	5	12	3	....	30	4,206
Picton...........	36	40	285	3,100	95	24,565	2,761	3.75	6,435,175	101	3,472	5	5	....	11	....	14	....	25	7,050
Plantagenet.......	46	59	221	1,309	56	10,575	2,906	3.84	2,926,757	207	1,820	10	6	2	....	1	3	1	17	4,076
Vankleek Hill	47	97	217	1,207	65	13,170	2,569	3.56	3,224,453	125	1,507	5	3	....	....	1	1	....	6	1,000
Totals........	941	1,723	4,852	36,801	2,681	340,829	2,700	3.65	85,809,909	3,198	48,223	129	136	26	63	87	49	29	490	$130,695

A MEMBER: Have there not been more gassy curds this year than usual?

Mr. PUBLOW: No, we have had less gassy curds this year than we ever had, generally speaking. The main difference was the flavor; we had more objectionable flavor.

Q.—What size factory would you advocate to equip for the manufacture of cheese and butter?

A.—I would not advise the manufacturer to equip, unless they had ten thousand pounds of milk a day.

Q.—Have you made any experiments of the sediment at the bottom of the whey to ascertain the amount of butter fat that sediment holds?

A.—No; I sent a sample to Kingston, and found from Mr. Walker's report that they found quite an amount of caseine in the whey.

Mr. PUBLOW: I might say that the average loss in Eastern Ontario is .22. We carried on tests, and we found that some factories were having as high as .41. We also found during the months of September and October that we had a very warm fall, and the loss in fat was very heavy.

A MEMBER: We got twice as much butter in October as we had in May and June.

Mr. PUBLOW: If the milk is delivered in a good condition, cool and sweet milk, it would never pay to skim the whey. We had a number of factories that had a loss of only .15.

ANOTHER MEMBER: Don't you think the tendency is for a great many makers to lead themselves to believe that they can save a great deal of fat by careless handling?

Mr. PUBLOW: I think if you have large losses in the fat, you will also have large losses in the caseine. When you have sediment or fat in the can it is due to one of two causes; you have lots of caseine or you are running out curds in your strainer. Your milk was working fast and the only way for you to do would have been for you to have knocked it about and give it rough handling. There is a greater loss of fat in the whey where you have over-ripe milk. I would like to know if many makers have much complaint to make in the milk in May and June this year? I never saw better cheese in Ontario than there was in May and June of this year. Take the Campbellford district. A few years ago they were noted for acidy cheese of poor quality, but last season during the worst part of the season, I inspected nearly every factory in the district, and with the exception of two factories, no man could point to any fault with the goods. The people in that district were simply sending milk in good condition. That is not due to any one man, but it is due to the individual effort of the people themselves. I would say right here that the makers of this country can do a great deal more than they are doing. There is a lot in the man in charge of the factory. It is not because the factory is small. You can make just as good cheese in a small factory as you can in a large one, but invariably the man in charge is not as skilled as he should be, and the competition is so great that they take in milk that they should not. I would say to the people that are taking good care of their milk to hold the maker responsible for the defective cheese.

Q.—Do you believe in paying by the test?

A.—I certainly do.

Q.—How is it that there are only twenty-eight factories in Eastern Ontario paying by the test?

A.—I would say that from the knowledge we have of the ability of the cheese-makers to do that work, it would be best to go slow, until you have men better qualified to do the work. I believe it is largely due to the lack

of men who are able to do the work properly that so little is practised to-day.

Q.—Would you advocate paying by straight fat or adding to it?

A.—I would say pay by the straight fat. From the tests made in Ontario to-day, there is not much danger of any man having his milk so rich that much injustice will be done by paying by the fat test.

Q.—In the sections where the tests are tried, and most of the factories are paying by tests, and these tests make 4 per cent. and 3 per cent., what was the difference in money value?

A.—In one it was $1.30 and another $1.00. The man that sends 325 lbs. of 4 per cent. milk would be giving away one dollar of his money to the man who sends 3 per cent. That is the way you are doing.

Q.—How is it that makers are not qualified to do this work?

SENATOR DERBYSHIRE: Possibly I can answer that question. In the Madoc district a maker lost the factory that he had been running for nine years. The farmers let the job out by contract to the lowest bidder; and this man lost the factory because he would not make it for a quarter of a cent less, or, to be accurate, a quarter of a mill on the dollar. The man they have hired is not competent to make cheese, and the man they turned out was a first-class man. How are you going to get the best men in the business, if you are going to skin them down to a mill on the dollar.

THE CHAIRMAN: This is opening up a very large question, and the dairymen of this country ought to take it up. We are criticised through the country because we are interfering with the rights of the citizens and the rights of the dairymen. I have read some criticisms that are so absurd that so far as I am concerned as President of the Association I thought it beneath me to reply to them. They say these Associations are sending men to the barnyards of the farmers to look them over and tell them what kind of people they ought to hire; and that we interfere with the rights of British subjects. Of course if trying to raise the standard of the work is interfering with the rights of British subjects, then we are doing that. They do not want us to say to them you must have a better cheese factory; they do not want us to say to them, you must have your milk in better condition and keep your stables in a sanitary condition. Sooner or later, if we do not mend our ways, this is bound to come back on us, because if the Englishman gets it into his noddle that we are making our cheese in an unsanitary condition, then the same trouble that arose from the meat curing in Chicago will come back on us, and if we do not keep our reputation in England, what does it mean to this country. I say it is our duty to see that every factory in Ontario that is sending a pound of cheese out of this country is making the best cheese that they can make. If a number of factories are allowed to send poor cheese out of this country, they will destroy the reputation of Canadian cheese.

We now have legislation and we can close up factories that are not kept in proper condition, and Mr. Publow under the direction of the Association has done so. At the present time every instructor is clothed with that authority. We have tried moral suasion in order to convert these people, and we are working along these lines in order to raise the standard. We cannot do this unless we have the dairymen of this country behind our backs. When you hear these criticisms, I want you to understand that we are doing what is right, and we are doing it in the interests of the people of this country. We want your sympathy, and your interest, and we want you to stand behind our backs and help us to carry out what we are trying to do. (Applause.)

Mr. JOHN SINGLETON: I would not like to take up any valuable time this morning, but I cannot allow this opportunity to pass without saying a work in connection with the valuable information we have received this morning. I take it that this morning's meeting has been the most valuable meeting I have attended in connection with this Association work during a number of years, and I think the dairymen of this country are placed under a great obligation to our Dairy Commissioner, Mr. Ruddick, for carrying out in such details the information he has given us this morning. When scientific people come in and demonstrate the fact that what we were doing a number of years ago is not the proper thing to do, then we should take advantage of the information we receive. We should have a uniform method of instruction and a uniformity among instructors to educate the farmers as to how to take care of their milk. A lot of valuable time has been lost in dipping milk and in airing it, and now we find there is nothing to do but to milk in proper condition, cool it down, cover it up and then let it alone. One authority teaches one thing, and another authority teaches a slightly different thing, and we do not know which to do. I hope in the future that the authorities will come to a definite conclusion on a subject they are going to place before the public, and be sure they are right before they give it to the people.

Speaking of paying by the test, one thing came up a few years ago, that placed more cold water upon that than anything, and that was when one authority at one end of the Province said one thing and another authority said another, and the matter had to be decided by the farmers as to which was right. It is an open question to-day, and until that is decided, and settled conclusively there is no use talking about paying by the test. I hope this information we have to-day will be hammered right home on the minds of our milk producers.

DAIRY BACTERIOLOGY.

BY WM. CONNELL, M.D., KINGSTON.

It is with much pleasure that I address this meeting to-day, as this is my home county and in this town I received my High School course.

Seeing that my work is limited to one portion only of the problems of dairying, I must of necessity in my addresses cover much the same ground year after year, varying the text if not the sermon.

By way of introduction let me point out that in the manufacture of cheese the maker is concerned in the control of a series of fermentations, upon the proper action and direction of which will largely depend the character of his product, certainly in so far as flavour and texture are concerned. This holds true, though not nearly to the same extent, in butter making. In cheese making the fermentations are partly those due to the action of unorganized (non-living) ferments or enzymes (such as rennet), and partly to the action of living ferment bodies which are found to be certain bacteria. Both these forms of fermentation are found to be essential in our process of cheese making. Thus good rennet is a necessity, for not only does it curdle the milk but its action is requisite for the proper ripening or curing of the cheese. More stress than is even now laid upon this matter will be found necessary in the future, and there should be some facilities provided by which the qualities of a rennet could be determined, as, to my knowledge, none exists now.

It is, however, with the second class of ferments—the living or organized ferments—that I wish to particularly deal this morning. In our process of making cheese it is necessary to develop acidity, first in the milk and later in the curd. This acidity is produced by the fermentation of part of the milk sugar into lactic acid by the action of certain bacteria. In this development of acid certain other products are formed which have largely to do with the flavour of the cheese. Why should it be necessary to develop this acidity? Largely for the reason that the curing ferment (pepsin) of the rennet requires acidity for its action and without acid the curing changes would be practically nil. But there is an additional reason why acid development proves advantageous. It is that acidity checks the development of most kinds of bacteria having to do with decay or decomposition so that the acid development adds materially to the keeping qualities of cheese and keeps cheese from decomposing. (I do not wish it to be inferred by any one that acidity cannot be overdone, however.)

Before proceeding further along these lines it would be perhaps better to make some general remarks on bacteria so as to make those present better acquainted with them. These bacteria are very minute plants, in fact practically the smallest forms of living (organized) matter definitely known. They are much smaller than the average fat drop in milk, so that it is hopeless to think of straining them out. There are known to be many hundreds of different kinds of bacterial plants, and these different species have so adapted themselves that they are found almost everywhere; so that air, soil, water, milk, our clothing, the surface of our bodies, etc., will always be found harbouring some kinds of these germs. But simply because bacteria are found it by no means follows that they are harmful or even are of importance, though no doubt all have some function, some purposes if you will, for existence. Thus certain kinds are found to be active in the production of disease in man and animals; other forms are very important agents in the soil in forming or building up food stuffs for higher plants; other forms again are actively engaged in the processes of decay, decomposition, putrefaction or rotting, whether of dead plants or animals; still others are important agents in the production of certain fermentations such *e.g.* as the making of vinegar. All these, while of great import in their way, are not being discussed to-day, the ones of interest to-day being those bacterial forms which can, when they gain entry to milk or its products, thrive in them and bring about changes. Now these changes are mostly of fermentative character, but some are true decomposition changes (these are of course closely allied).

I have said that bacteria are plants, and like other plants they require certain things for their growth and reproduction, the main requirements being suitable food, moisture and temperature. The food required will vary with the kind of bacterium, but milk is unfortunately a good food material for a considerable number of bacteria, and of course it possesses the requisite moisture. As to temperature, bacteria differ in their requirements but with milk it may roughly be said that the nearer the temperature goes to 100° F. the more rapid the bacterial development; while with fall of temperature growth is slowed, *e.g.* at 60° F. takes 3 to 8 times as long to develop as at 95-100° F., at 50° F. takes 8 to 15 times as long; while at freezing point all growth comes to an end. By controlling the temperature of milk there is placed in the hands of the patron a means of controlling bacterial development, a means which is secondary only in importance to that of prevention of seeding of the milk by employment of cleanly methods.

I have already pointed out that the development of bacteria capable of producing acidity with proper flavour production is not only an essential but a necessity in our process of cheese making. Now this development of acidity in milk is the natural change noted in milk when kept in this country; that is, the milk sours, and this is due to lactic acid production by certain bacteria, and the acid production in cheese making is merely a like process controlled and modified by other fermentations. Acid producing milk bacteria are thus widespread, and under ordinary conditions are generally found in the milk. Not all acid producing forms are, however, desirable, as a number of these forms while producing acidity combine with this the formation of bad flavours, of gas production and the like, and are even more deleterious to cheese than would be the entrance of many non-acid producing bacteria. It is the duty of the cheese-maker to foster the growth of the proper forms of acid bacteria, and it is the duty of the patron to furnish milk free from undesirable forms of these bacteria. The milk of one or two patrons containing these undesirable forms will when introduced into vat make trouble for the whole lot of milk contained therein. It is a case at such times of sowing tares with wheat, the wheat may have gained such headway that the tares are not much remarked, though still there, or on the other hand the tares may choke out the wheat. The patron or maker who knows nothing about bacteria may well ask how is he to know if such germs are present? To this I can only answer that the only practical test applicable to every-day practice is that of the nose, reinforced by sight and taste; their presence is made known by the results produced only. Of course fermentation tests or even a bacteriological examination can be made, but these consume time, and it is up to the maker to dispose of the milk when it is presented at his doors. It is very essential then for the maker to develop a discriminating nose and a seeing eye. It is my duty and that of other investigators to point out that these undesirable changes have their cause in the presence and growth of undesirable forms of bacteria. The maker notes the conditions produced in the milk and the alterations in product, I and others have to examine into the causes, their methods of action and to try and devise means that will lead to their elimination.

In examining milk and cheese the main forms of undesirable bacteria found are certain forms which while producing acid (some of them abundantly) also produce certain evil by-products such as gases, bad flavors and the like. Now such bacteria come mainly from manure and manure laden dust. This manurial dust falls from the udder and sides of cows during milking; is found on hairs and is in the dust of stables, barnyards and roads. Such bacteria if they gain headway in milk are of course also present in increased numbers in ordinary whey, and when cans are used to carry home whey, if cans are not thoroughly cleaned and scalded, will be an important source from which seeding can occur. Cleanliness of the whey tank assisted, if necessary, by pasteurization will largely remove this source of trouble. A rather common practice, and one which is decidedly objectionable, is that of leaving pails used for the evening milking unwashed and exposed in or near milking places, and thus certain to acquire and retain a dust coating, especially when windy or when exposed to dust raised by animals in passing. Practically one finds that the seeding of milk with undesirable bacteria is due to some lack of cleanliness during milking, or in care of milk and milk utensils. I am not going to dilate here on the factors necessary for cleanliness in milking and handling milk, but would point out that as the strength of a chain must be gauged by that of its weakest link, so lack of care in one particular may neutralize care in all

others. The gist of the matter lies in this, that cleanliness in all particulars—of milkers, of animal, can and pails and of milk stands—plus care in cooling of milk, will assure at all times a good wholesome milk to our factories.

There are several matters connected with our household and dairy work that I would like to speak a little more particularly about this morning; these are the common fly, and water supplies at farms and factories.

The common fly has always been considered an annoying insect; but with a better knowledge of its life history we can add the additional fact that it is at times a disease carrier. The fly breeds in manure commonly, less frequently in decaying food, so that the presence of considerable numbers of flies in a house or factory means always the presence of filth somewhere in the immediate neighborhood, a condition of affairs which should not exist. Further, the habits of the fly are not of the cleanliest, as most of you are aware. It is not averse to crawling over a mass of filthy excreta, and then trailing over a dish of food or a bald head if either of these are convenient; or in a factory taking a bath in the milk, etc. Disease-producing bacteria have been carried in this way, particularly the bacillus of typhoid fever, and I have traced to flies one serious tainting of cheese in a factory in Northumberland Co. As an instance of the numbers of bacteria the common fly will carry, let me quote you the figures given by Prof. Easton, of Cornell University, as they are very interesting.

Prof. Easton caught 100 flies in a kitchen, put them in a pint of sterilized water and rinsed them about, and then examined the water, and found that he had raised such a number of bacteria off that each fly averaged over 300,000. He next caught a similar number in the cow barn and they averaged over 800,000 each, another hundred in the pig pen and they averaged over 1,000,000 each, a fourth hundred were caught about the swill pails and they ran up to 1,500,000 bacteria apiece. Do you wonder that some of us object to seeing flies in the milk jug. I think I can say that when one goes into a factory or a house and finds many flies, one is immediately justified in condemning the sanitary surroundings of such premises. One, too, can appreciate the fact that in factories where flies abound it is next to impossible to keep them out of the milk, and the seeding of the milk by the bacteria which they carry must be very appreciable. It is ten years ago now that I first brought this matter to the attention of the dairymen, but it still needs emphasizing, as too many seem to think the fly a necessary, if annoying, evil; but truth is the fly serves no good purpose or serves a purpose which can be better performed in other ways.

The other matter which I desire to discuss before bringing this address to a close is that of water at farms and factories. The ideal drinking water of most persons is the clear, colorless, sparkling water of a spring. So strong a hold has this ideal that it is very difficult to convince the average person that water having these characters can at times be other than wholesome, and conversely, that water lacking in any of these qualities is suitable for use. The origin of this idea is not far to seek, for early settlers in this country drank such water wherever they found it, and found it to be good. Wells were dug as near the door as possible with a full belief in the purifying properties of mother earth. Factory wells are often just outside the factory or even in the boiler room. Now when the soil is virgin, and when waste of man, animals and of manufacturers is not thrown out on the ground in the neighborhood (and this may mean 50 to 250 feet according to well or stream situation and trend or dip of country) of well or stream, then confidence in such water was justified. In other words so long as the

collecting area of the water supply is kept free from waste of human and animal life, so long will a water supply be safe, for as a rule the dissolved mineral and vegetable substance in water are harmless. But is it common practice to so protect the collection area of a well about a house or factory? In 90 per cent. of the cases the reverse is true, and we have as a people been so far exceedingly careless in the disposal of our wastes—the slop water of houses, the drain water of our factories, even the excreta of man, and most certainly very careless in the disposal of the excreta (manure) of animals. The result of such carelessness is that very often wells and springs and streams become more or less polluted with these wastes, and must then be classified by sanitarians as "potentially unsafe." They may not actually lead to disease production in man or animals; in fact unless the specific disease agents are present, such waters will not carry disease; but the point is they are polluted, and while the polluting material to-day may be quite harmless, to-morrow it may be dangerous. In the same way at factories, when factory or other waste gains entry it may not seriously interfere with the water for cleansing purposes or it may become a dangerous menace to the purity of the butter and cheese made therein. Let me point out that in one common type of well in this section of the Province, *i.e.* the surface well, that the origin of the water in the well is the "ground water," this being the water absorbed into the soil and passing downward till held by an impermeable stratum or layer of rock or clay. At times this water is high, that is, the soil has absorbed such quantities that it fills up all the interstices of the soil and may reach to or above the surface, as is seen not infrequently in the spring of the year or after very heavy prolonged rains. This ground water flows very slowly in the direction of the "dip" of the country. A well is simply a collecting pit for this water, and rises and falls with the ground water. Ordinarily the more water used from a well the greater will be the drainage area of the well, and in dry seasons a well may be draining the ground water for several hundred feet about it. Now the water as it passes through the soil carries down with it much of the waste on the surface, at least, all the soluble portion and the finer particles such as bacteria, etc. The soil through which such water passes undoubtedly filters this water, but much of the material may pass impurified though cleared and looking bright and sparkling, and may appear in the well or spring; for springs are simply places where the ground falls away so that the holding layer of rock or hard-pan comes to surface and the ground water flows out above it. Now what is the condition of the water in our wells in this country? Prof. Shutt, of the Experimental Farm, has said that the majority of the farm well waters submitted to him for analysis are but little better than cesspools. My own experience of well waters from farms, villages and factories unfortunately shows Prof. Shutt's statement to be well founded, as during 1907 and 1908 I have made an analysis of 299 samples of well or spring water submitted to me and of these 175 were contaminated with bacteria of intestinal origin. In other words they contained bacteria which originated in the intestines of man or animals, and hence were classed as "unsafe" waters. This is a percentage of 58.8 per cent., a high average, of course, but I regret to state that the factory samples sent me when considered alone averaged over 65 per cent. polluted with factory waste or with excretal bacteria. Of course the samples sent me were sent for the most part because they were under suspicion, but decidedly this percentage is too high. It means that we have been very careless about the disposal of our wastes—that it is time we wakened up to the fact that we must provide better drainage about our farm houses and factories and protect the drain-

age area of our wells and springs from pollution. This is essential not only from the health standpoint, but from the dairy point of view, because not once but on numerous occasions defect in butter and cheese has been traced to polluted water at dairies and factories.

I am, to-day, simply asking that the doctrine of cleanliness, preached for years as essential in factory and in care of milk, be given a little wider extension, and that it rid us of our fly pests and of our polluted waters.

ADDRESS.

By J. H. Wilson, Saskatchewan Dairy Department, Regina.

I did not come down here to take up any of your time. I merely wanted an opportunity to sit in the audience and learn a little. I have been separated from the dairymen of Ontario for quite a number of years, and I am glad to meet so many old faces here to-day. It is ten years since I went West. I have had an opportunity of attending these conventions once in three years, and it always gives me a great deal of pleasure. I have listened closely to the addresses given yesterday and to-day, and I am sure I will return West better fitted for my duties.

When it was suggested to me by the Commissioner of Agriculture and the Deputy that I should come to Ontario to attend the Eastern and Western Convention, I did not hesitate to accept. In addition to that, I asked for three months' leave of absence, and during these three months I intend to spend the time at the Guelph Agricultural College, to better fit myself for the duties that lie before me.

Senator Derbyshire does not hesitate to put forth the claim that Brockville district is in the lead, but I want to tell the worthy Senator that in the course of a few years we will have something in the West that will give Brockville a close run. Saskatchewan is considered the infant dairy province of the Dominion. In my work in the West I am profiting by my work in Ontario, and I am trying to avoid the ruts you have fallen into.

We are advocating centralization. Very stringent regulations have been passed, which I think have served a good purpose. We have very good control of the co-operative dairy industry of Saskatchewan. The regulations provide that no dairy can be erected without plans and specifications being first approved, and no creamery can be erected within twenty miles of an existing one, and no creamery can be erected until the site and plans have been approved by the Department of Agriculture, and we also have a clause in our Act which provides that a shareholder who is not a patron cannot receive more than 5 per cent. dividend on the money invested. We met with great difficulty in the early history of the Province by our townspeople and merchants advocating the establishing of creameries. They invested their money and very few farmers took stock. The townspeople were safe because they drew 8 per cent. and in one case 9 per cent. As it is now, there is not much danger of a merchant in town advocating a creamery, when he knows he cannot draw more than 5 per cent. We have adopted centralization to such an extent that the Government pays all the express charges on all the products, and the farmer who lives 100 miles gets the same profit as the one who lives near the market. Last year we had 37 applications for creameries and only one creamery erected. This year we had 18, and so far it has not been decided to build any creameries.

In conversation with the Commissioner of Agriculture, before I left Regina, he said he was afraid the farmers would become too enthusiastic about co-operative work, and we would be unable to prevent the erection of creameries that we thought would not be successful. I made the statement that where I could get a party of farmers together to discuss the situation with them and present the policy of the Department, that in nine cases out of ten they would side in with the Department, and discourage the erection. In the year 1907 we had a struggling existence. In fact, I despaired as to whether we would be able to get the best of our creameries going. In the agreement of the various associations with the Province, the patrons must bear the actual expense. The Government undertakes to sell the product, and that is done free of charge, but the patrons must bear the actual cost of the manufacture. That year it cost the farmers in one of our small creameries ten cents a pound to manufacture. In 1908 we were able to increase the amount 225 per cent., and the highest cost of manufacture was four and one-half cents, and two creameries have manufactured for less than three cents.

Our revenue from dairy products is nothing like what it is in Ontario. We are in the state Ontario was in thirty years ago, but in time you will hear from Saskatchewan. The products last year from creameries amounted to 400,000 pounds of butter and the revenue derived was practically $1,-000,000. Next year I look for an increase of 50 or 100 per cent. We have introduced the travelling dairy school, and last year we had special dairy courses that travelled throughout the whole Province; and in addition to this we are endeavoring to assist the farmers to secure a record of each individual in the herd. Early settlers in Saskatchewan devoted their farms to wheat growing, because that was what the land was best fitted for; but now other portions have been opened up that are well adapted to dairying, and there is no doubt it will increase. (Applause.)

Q.—What does the farmer receive now for a pound of butter?

A.—The average for creameries in our control for last year was somewhere over twenty-two cents; that was the net return to the farmer.

Q.—Is that for butter or butter fat?

A.—Butter fat.

THE DAIRY SITUATION IN EASTERN ONTARIO.

BY J. A. RUDDICK, DAIRY AND COLD STORAGE COMMISSIONER, OTTAWA.

It is now twenty-six years since I first came into close touch with the dairy industry of Eastern Ontario, as Superintendent of the Allengrove combination of cheese factories, in the Counties of Glengarry, Stormont, and Prescott. A large number of the factories in that part of the country were started in the eighties, so that my connection goes back to the early days of the industry, and it is quite natural that I should have watched the development of this section with particular interest. In the spring of the year 1889 I quit the manufacturing end of the business to take up educational work, at the invitation of this Association, for it was in that year that Mr. Publow and I were appointed instructors for that part of Ontario east of Kingston, my particular territory being all east of the Brockville and Ottawa Railway line. For two years I covered the whole of this large district, but it must be obvious to anyone who knows the country that my efforts were

necessarily spread rather thinly where so much ground had to be gone over. Since joining the Dominion service in 1891 I have come into contact with other phases of the industry, and more particularly with its commercial side and the problems connected with storage and transportation. I have had exceptional opportunities, through access to literature, travel and personal contact with experts from all over the world, for acquiring information relating to the dairy industry in its various aspects, both productive and commercial. I make this rather personal reference to establish my claim, as it were, to speak with some authority on the dairy situation in Eastern Ontario, with particular reference to the extreme easterly portion of it.

I shall confine my remarks to the cheesemaking branch of the industry, not because the buttermaking branch is of no importance to those engaged in the manufacture of cheese, but because the inclusion of both branches would make the subject too large for this paper.

Eastern Ontario, viewed from the standpoint of cheese production divides naturally into three main districts, each with certain features which distinguish it from the others, and which for the present purpose may be designated as Central Ontario, Brockville and Eastern districts. The Central Ontario district, which includes Prince Edward, Hastings and Peterborough Counties, and of which the old Belleville district was the beginning and is yet a kind of natural centre, was the first part of Eastern Ontario to win prominence in the cheesemaking industry. The cheese from this district early acquired a good reputation on the British Market, and the Belleville district was recognized as leading Eastern Ontario twenty-five or thirty years ago.

The factory system was started near Brockville about the same time as it was in the Belleville district, but the development was somewhat slower. The limits of the Brockville section have never been very clearly defined. It is said that at times the boundaries have been stretched to take in a good part of Eastern Ontario. It has even been hinted that portions of the Province of Quebec have been included,but we are not concerned with that phase of the question at present.

The third or eastern district embraces the territory included in the Ottawa Valley and the Counties of Glengarry, Stormont and probably Dundas, or, in other words, the country lying north and east of the Brockville section proper. This was the last part of Ontario to engage in dairying extensively, and probably the most notable feature of the development of the industry in these counties was the organization of large combinations of factories under one management. The Allengrove combination of factories, now broken up, was the largest ever known in the history of cheddar cheesemaking. That combination, along with several others, at one time practically controlled the manufacture of cheese in these counties. It is not unreasonable to suppose that the combination plan of organizing the factory end of the cheese business has had some influence on the progress of the industry in a territory where it was so generally followed. The system has many advantages, especially where conditions tend towards small factories. It also has some disadvantages and one is that the patrons and the management are not brought into close contact with each other, with the result that the patrons do not learn to take the same lively interest in the business as they do where the co-operative or single proprietary factory systems prevail. In one respect the pioneer factory-owners of the eastern district, although they are deserving of the greatest credit for their early enterprise, made a serious error in adopting a low standard for their buildings and equipment. This gave the section a bad start, from which it has never

recovered, for we still find in the extreme eastern counties the poorest buildings and the most unsatisfactory conditions surrounding the manufacture of cheese which are to be found in any part of Ontario.

It will be interesting at this point to consider the extent and distribution of the cheesemaking industry in Eastern Ontario. According to the returns of the Census and Statistics Office for 1907, the counties lying east of York and Simcoe, but not including these two, produced in that year 104,367,739 pounds of cheese, valued at nearly $11,000,000, or considerably over two-thirds of Ontario's total output. We find that the business of dairying is most extensively followed in the eastern group of counties, which, including Leeds and Carleton, are credited with about one-third of the total production of cheese in Ontario. The exact figures for the Counties of Leeds, Grenville, Dundas, Stormont, Glengarry, Prescott, Russell and Carleton are 49,404,287 pounds, valued at $5,760,55. the County of Dundas produces more milk per acre than any other county in Canada, the value of the cheese from that comparatively small county in 1907 being over one million dollars. No other section of Ontario is so largely devoted to dairying as that which comprises the counties in the extreme east. The farm revenues depend more on dairying in this district than they do in any other division of the Province. In the counties bordering on Lake Ontario, fruit growing, the canning industries and beef raising divide the attention of the farmers to some extent, and in Western Ontario the diversity of farm industries is even more pronounced.

Referring again to Central Ontario, I have already stated that this district was a leading one some years ago; but having attained that position, the dry rot of contentment began to take effect, and before many years the Belleville district was obliged to yield the banner to the Brockville section. I am not sure that my Belleville friends will admit this, but that is the way it looks to a disinterested observer. There is more to be said in this connection, however, because as soon as the dairymen of that district realized that they had lost the place of honour, although it took some years to convince them of the fact, they immediately set about putting their house in order, with what result we shall see as we proceed. The beginning of the cool curing movement found the district in a receptive mood, and this means of recovering their position has been adopted to such an extent that within the past five years a large number of the factories in the Counties of Prince Edward, Hastings and Peterborough have been equipped with cool curing rooms. In this important reform the district easily leads Eastern Ontario, especially in Prince Edward County. Every cheese factory in the Township of Ameliasburg is now equipped with a cool curing room. I am informed that the one factory which did not adopt the improvement has closed its doors and the milk will go to the others. All told, there are thirty cool curing rooms in the Central Ontario district. I would not have you think that I look upon cool curing as the whole thing in progressive cheesemaking; but I do look upon it as a very important factor in determining the reputation of the cheese of any particular district. I am only repeating common talk in the trade when I say that the Central Ontario district, especially the Picton section, has come rapidly to the front again since it adopted the cool curing system so generally.

Now let us see what has been doing meantime in the other districts. I find that there are only seven cool curing rooms east of Kingston, all of which may be credited to the Brockville section, because there is not a single one, as far as I know, in the eastern district.

I am afraid it is a case of history repeating itself, and that the dairymen of the Brockville section have, like their brethren of Belleville at an earlier period, already mentioned, been relying on past achievement rather than on present effort, and in consequence they have been standing still while other districts have been going ahead. I say this with all kindliness and without any intention of giving offence to my friends in this district. I ask them to bear in mind that I am quoting actual facts, not opinions, in support of this conclusion. I am not responsible for the facts.

Another matter has attracted my attention in preparing this review of the dairy situation in Eastern Ontario, which I think is worth mentioning. Members of the Convention are aware that the Branch of the Department of Agriculture over which I have the honour to preside has for several years been encouraging the organization of cow testing associations for the purpose of studying the performance of individual cows. Many people think this movement is calculated to add more to the profits of dairying than any other scheme which has ever been proposed with that end in view. I need not go into details, because the subject has been ably presented by my assistant, Mr. Whitley. It will be sufficient to say that there are 20 of these associations in existence in Eastern Ontario. Of this number 14 are in the Central Ontario district, which leaves only 6 east of Kingston, although the same effort at organization has been made in all parts of the country. These two movements, the cool curing of cheese and the improvement of the dairy herds, strike to the root of profitable dairy farming, the one by increasing the yield per cow, the other by improving the quality of cheese and thus insuring a good demand at a higher level of prices. For these reasons they deserve the careful attention of all dairymen.

Now we come to a point which should be emphasized. I have tried to show you that these three districts of Eastern Ontario have been progressing along certain lines in inverse ratio to their dependence on the dairy industry.

Does it not seem remarkable that the farmers who derive the largest proportion of their revenue from dairying appear to the ones who are giving the least study to questions affecting their interests? I put it that way because it can be nothing but a lack of information which results in such backwardness as I have described. No intelligent man can have any doubt as to the value of the cool curing of cheese, or of the keeping of records of his dairy herd, once he is in possession of all the facts bearing on these questions.

Mr. Whitley has given you some facts concerning the testing of dairy cows, and I ask your indulgence while I give you some of the facts in regard to the cool curing of cheese. My own opportunities for getting information on the subject have been many, and I state most positively, after comparing the results of hundreds of tests, I have invariably found the cheese cured at 60 degrees and under to be better in flavor and texture than other cheese from the same vat, cured at higher temperatures. But I do not ask you to take my unsupported word for it. I refer you to the pages of my annual reports for opinions of cheese merchants in Great Britain; ask any honest buyer in this country; ask Mr. Publow, the chief instructor; ask any of the instructors whose territory includes cheese factories with cool curing rooms; ask the representatives of any of these factories, and be guided by what they say. I shall be glad to send anyone a list of all the cheese factories in Ontario which are equipped with cool curing rooms. Here is what some of them say.

Mr. J. A. Holgate, patron and salesman of the Foxboro factory, in a letter recently received from him, makes the following statement: "I have tried to make a careful estimate of the matter and I am convinced that in the last two years, during which we have had a cool curing room, we have had at least $600 a year profit from cool curing, on an output of 200,000 pounds

of cheese, besides the satisfaction of having an article of cheese that all the buyers want. Our factory cost us about $600 more with the cool curing room than it would have cost without the ice chamber.'' That is to say, they were repaid for the outlay in one year.

Mr. G. A. Gillespie, of the Central Smith factory, writes: "It is quite safe to say that they (the patrons) have realized $900 in three seasons from an outlay of about $400.

Mr. J. R. Anderson, a patron of the Mountain View factory, says, "I can honestly say that we are pleased with the cool curing of cheese here."

Mr. T. E. Whattam, Dairy Instructor in Prince Edward County, writes: "In talking with the factorymen who have cool curing rooms, I find them well pleased with the results they have had, and confident that there are better things in store in the future when the benefits of cool curing are better known by the trade as a whole. I wish to say there is no comparison in the quality of cheese cured in the ordinary way and those cured in the cool rooms. I believe cool curing has helped the industry in this district more than any other advanced step in dairying in late years."

I could cite any number of similar statements. The gains mentioned are made up partly by saving of shrinkage and partly by increased price as compared with what would have been received for the same cheese had they been ordinary cured.

I am well aware that cool-cured cheese do not yet receive the premium that they should over ordinary-cured, but I would like to point out that the value of cool curing is not to be measured wholly by the relative price at which the cheese sell. There are many advantages besides an advanced price for the cheese, all of which put extra money into the pockets of the milk producers. In the first place there is a saving of shrinkage, which is very considerable, amounting to about one per cent. In many cases there is a saving of cuts, because there are many cheese which pass without question when cool-cured, that would have developed undesirable flavours and other objectionable qualities if cured at ordinary temperatures. The patrons of factories with cool curing rooms receive more money for their milk than they would do if the cheese were ordinary-cured.

Then I would remind the dairymen of Eastern Ontario that every pound of cheese they have sold during the past season brought a higher price, relatively, than it would have done if a certain number of the factories had not provided cool curing rooms and thus raised the general average quality of all the cheese and increased the demand by encouraging consumption. I have not heard that any of the factories where the improvements have not been made have objected to receiving this premium on the price of their cheese.

The cool curing movement has emphasized the importance of cool transit and has attracted attention to that end of the business. The result is that all Canadian summer cheese are now landed in Great Britain in cooler condition and milder in flavor than they formerly were, a circumstance which has materially helped to give tone to the market.

Now it must be admitted that the Belleville and Picton districts differ from the Brockville section in this respect, that the factories there are mostly owned by the farmers themselves, while in the Brockville and Eastern district they are more largely proprietary. This is probably the reason why the Central Ontario factories as well as those in Western Ontario have been quicker to take hold of this question. But it is not a sufficient reason, for if it has paid the patrons of the co-operative factories, as shareholders in the

companies, to incur the necessary expense, will it not pay the patrons of proprietary factories, who will derive all the benefit, to contribute in some manner to the cost of securing the improvements?

The owners of factories can hardly be expected to meet the whole expense out of the low rate for manufacturing which now prevails, in view of the fact that they will not receive any direct benefit from it.

Now, are the dairymen of the Brockville district going to repeat what they did some years ago when they wrested the supremacy from the old Belleville district, or are these two eastern sections to go on losing probably a quarter of a million a year through failure to take advantage of modern improvements, and at the same time endanger the future of a trade which is of so much importance to them? New Zealand is every year becoming more of a factor in the cheese trade, having doubled her output in two years. Now, note this point: the cheese from that country are all practically cool-cured, because the weather is never as hot there as it is here. This is a new kind of competition and it presents some features which should cause Canadians interested in the cheese industry to do some thinking. Bear in mind that New Zealand cheese arrive in Great Britain during the winter and spring months, or the period of non-production in Canada. If we continue to send cheese of indifferent quality, with heated flavours, etc., merchants in the Old Country will be disinclined to stock up with them for winter trade, but will wait and get a supply of the New Zealand cool-cured, and thus encourage the production of more and more cheese in that country. New Zealand is not a large country, but it is large enough to produce an enormous quantity of dairy produce if there is sufficient encouragement. The output of cheese in New Zealand this year will be, roughly speaking, 400,000 boxes, quite enough to have a material influence as well as a sentimental effect on market conditions. I do not think the alarm which is felt in some quarters over New Zealand competition will be justified if those engaged in the cheese industry in this country make the most of their opportunities. Our safeguard is to make a superior article so as to get a firm position in the market, but to do so we must adopt every reasonable means to that end. We should surely avail ourselves of a plan which ensures immediate returns for the outlay as well as security for the future.

Incidentally I would remind the members of the convention that I am prepared to send plans and specifications for cool curing rooms, free of cost, to any one who applies for them. We will give every assistance in our power towards the building of new factories or in remodelling old ones.

There is another question, somewhat related to the cool curing of cheese, on which I have received enquiries during the past year and which may be of some interest to this meeting. I refer to the proposal to erect central warehouses at points in Eastern Ontario where the cheese could be collected for the purpose of inspection and sale. It has not been made at all clear whether such proposed warehouses, are intended to be cool cheese curing rooms, or cold storage warehouses.

Most probably the proposers have not been very clear on the point themselves. The distinction is a necessary one, however, because the two things are entirely different.

One thing is certain, and it is this; the benefits of cool curing cannot be secured with a central warehouse unless the cheese are delivered there every day, and that means extra expense, as against the usual plan of delivering to the shipping point once a week, or when a sale is made.

Another point to note is that the Government cold storage subsidy cannot be secured unless the warehouse is equipped with mechanical refrigera-

tion, and it would be very poor business policy to incur the expense necessary to so equip a cheese storehouse in a locality where ice is available and when the required temperature is not below 50 degrees.

There may be certain localities where the entral curing room idea, or a warehouse through which the cheese could pass for inspection and sale, would work out to advantage, but on the whole, the suggestion does not appeal to me as a very practical one.

It is a very convenient way to sell the cheese. We found it so when the Government cool curing rooms were in operation, but the advantages are not worth the additional cost which is thus incurred in the marketing of the cheese, all of which must come out of the milk producer, and which will be greater than appears to be generally supposed.

It has been said that the cheese would be sold on their merits under such a plan and that there will be proper discrimination in price according to quality. It is a very regrettable feature of the cheese trade as well as of other trades, that the producer of a superior article does not always receive the premium which he should. It is generally admitted that nothing would so quickly bring about improvement in the quality of cheese as to have them sold strictly on their merits, but I fail to see why it should be assumed that this reform would be brought about through the medium of local warehouses. The same forces which now impel the buyer to pay a uniform price, and which influence the salesman to demand it, would be at work under those conditions just as they are under any other.

It seems to have escaped the attention of some people that the principal reason why cheese are bought without proper discrimination in quality is because the salesmen demand a uniform price. If John Jones sells his cheese for 12 cents, all the other factories in the neighborhood insist on geting 12 cents also, regardless of quality. Every person knows that that is what happens at the cheese boards. It is what would happen in a warehouse if the cheese were being sold under the trier, because just as soon as a salesman found that he was not being paid the ruling price for his cheese he would withdraw and offer them through some other channel; so the buyer does business along the line of least resistance.

I have for some years thought that the best plan for selling Eastern Ontario and Quebec cheese would be to have a central receiving warehouse at Montreal, where the cheese could be officially graded and then sold by auction, without any recourse. That is to say, the price bid at the auction would be final. The official grading would relieve the buyer of the onus of discrimination, which appears to be the chief difficulty at present. This plan would not involve extra handling or expense, because the cheese would be going through the most direct channel. But there are many obstacles of a commercial nature in the way of giving effect to such a plan, and the disinclination on the part of the average salesman to accept a verdict which puts his cheese out of first grade, no matter how independent or reliable the official may be who passes judgment on them, would be a difficulty in the way of successful operation.

There has been some discussion in Eastern Ontario recently about methods of selling cheese, and the question has been magnified to an extent out of all proportion to its importance compared with other matters affecting the industry. The result of this agitation, as far as it can be said to have had any result, has been to divert the attention of some dairymen from questions of much more real importance to them. The manner in which the agitation has been conducted has been harmful by creating ill feeling between different classes or interests connected with the trade. If there are

any wrong practices, and I shall not deny that there have been, they will not be put right by wholesale charges of dishonesty or mean insinuations and abuse of those who may offer contrary opinions. Abuse is not argument, and is always the resort of a man who has a weak case. I know the men who are included in the different divisions of the cheese trade, from patron to buyer, as well as any person, and I am bound to say that I have found one just as honest as the other. It will do no good to create unwarranted suspicion in the minds of those who have to deal with each other.

In regard to the selling of cheese, I would repeat again that there is only one thing of real importance, and that is, to have an article of superior quality. All other considerations are insignificant in comparison. The factories which have earned a good reputation by turning out a superior article year after year never have any trouble. The competition for their cheese enables them to pick and choose as to whom they shall sell them. Of course, ordinary business prudence demands that some care shall be exercised in dealing only with houses in good financial standing.

It is important also that the business of selling the cheese should be put in the hands of competent men. There are a great many men acting as salesmen for cheese factories who have no special knowledge to qualify them for such a duty; men who do not know anything about the qualities of cheese or of proper business methods, and it is not surprising that they sometimes get the worst of the bargain. Salesmen of this kind are a positive barrier to progress, and they have cost the patrons of cheese factories of this Province a great deal of money, both directly and indirectly. When such a man offers inferior cheese for sale, he will not be convinced of the fact like a man who really knows something about cheese. He assumes that he is being imposed upon instead of finding out the cause of the defects and having it removed. Thus the evil is perpetuated and the losses go on. If the matter is in the hands of a capable man, he will find out where the trouble is and seek to have it remedied.

I believe the middleman is a necessary factor in the successful handling of the Canadian dairy produce trade. In the marketing of cheese, its distribution to the different centres in Great Britain calls for special knowledge, because these different places demand cheese of widely different character. It is a well known fact that cheese which will give satisfaction in the Manchester market are not wanted in London. The same may be said of Glasgow, Liverpool and other points, all of which have their peculiar fancies. It is here, in dealing with these special requirements, that the training and experience of the middleman is useful in realizing full value for different kinds of cheese.

Then there is another very important consideration. Canadian cheese amounts to between 70 and 80 per cent. of the total imported into Great Britain. The consumption of cheese goes on throughout the year, but the manufacture in Canada, as every one knows, does not extend over a period of more than about seven months. The result is that as the season advances the surplus of supply over demand gradually increases. The middleman speculates with this and holds it until such time as it may be required for consumption. It must be very plain to anyone that if all our cheese were forced on to the English market, as it would be on a consignment basis, as soon as it is made, the market would be demoralized before the end of the season. It is safe to say that if every box of cheese made in Canada this year had been consigned to Great Britain within three or four weeks after it was made, cheese would now be selling for a very much lower price than it is. Without the middleman or exporter we would lose the advantage of

the competition for the cheese, which often raises the price higher here than it is in England.

Now, Mr. President, there are many other things which I might discuss, but this paper is already long enough. I cannot close, however, without mentioning one feature of the dairy situation in Eastern Ontario, concerning which there is good reason for congratulation. I refer to the work of dairy instruction. The dairy associations of Ontario are entitled to the credit of having inaugurated a scheme for dairy improvement, when they first employed instructors to visit the factories, which has since been adopted in some measure by every important dairying country in the world. It was exactly 30 years ago this coming season that the Western Association employed the late Prof. L. B. Arnold, of the State of New York, to introduce his new method of cheesemaking, which was known as the "sweet" curd system to distinguish it from the so-called "acid" system then in vogue. Mr. J. B. Harris, of Antwerp, N.Y., was engaged by your Association in 1881, and two following seasons, to visit the factories in Eastern Ontario. After that, Canadian instructors were employed, and it should be a matter of pride to us all that it has never since been thought necessary to go outside of the Province for dairy teachers; and what is even more complimentary, the United States, New Zealand, Australian and Scottish authorities have induced many of our best men to accept service in those countries. The dairy instructors never had a fair chance until they were made independent of the factories, as they are at present. The value of the instructors' work has been increased enormously by the aggressiveness and fearlessness engendered of freedom. It is gratifying to find these men taking their place as leaders in their respective localities. The successful instructor must possess other qualities in addition to technical skill of a high order. He must be tactful, patient and persistent, as well as industrious. A blustering, grouching, faultfinding manner destroys the effectiveness of any man's skill in this kind of work, because the Canadian temperament calls for a leader, not a driver.

It has always appeared to me that there should be a little more organization in connection with the different districts, but as long as the matter is under the energetic and capable supervision of Mr. Publow we have an assurance that the work will be well done. As a last word, let me say that this scheme of dairy instruction should have the hearty support of every Ontario dairyman, for it has put millions of money into the pockets of the milk producers.

The CHAIRMAN: The last few years at the meetings of our Associations we have been honored by having with us representatives of the Produce Association in Montreal. We have always been very glad to have them with us. We have had an opportunity of seeing the men we are doing business with, and we have been able to talk to them and ask questions as to what becomes of our goods. To-day we have with us one of the veteran buyers at Montreal, whose name is a household word to every dairyman in the Province of Ontario. I refer to Mr. A. A. Ayer. (Applause.)

ADDRESS.

By A. A. AYER, MONTREAL, QUÉ.

I am very pleased as President of the Montreal Produce Association to be here with you this afternoon, and to extend our congratulations and best wishes to your Association, and more especially in veiw of the fact that it

is now well-known that Eastern Ontario is the most important cheese making section of all Canada.

I regret that I had not the pleasure of listening to your President's address, and the facts that he set before you, but I had it placed in my hands since, and I congratulate him upon the way in which he presented the conditions of the trade to you.

Professor Ruddick has entered into a great deal of detail on some things that I propose speaking to you about, therefore I will only need to refer to them.

I suppose it is the tendency of most successful men to be optimistic, and they have a sort of way with them of not referring to the things that are not pleasant. They look upon things from an optimistic side, and they can hardly bring themselves to see that the cheese industry during the past year has not been a prosperous one. Nevertheless, we might as well face the fact and say it is not as prosperous to the farmers and merchants as it has been in many years. It is good for us now and again to have these little set-backs. It teaches us, and it reaches our pocket like nothing else can do. This is not a time to boast of the net results of the past season, but it is a time in which we might look at the plain facts—that we might face the difficulties that are before us and try to overcome them.

Let me say at the outset that I think a great deal of time and attention has been given by the farmers of this country to the marketing of cheese, and my opinion is that the system of marketing cheese in Canada for all practical purposes is as nearly perfect as possible. I do not say improvement cannot be made here and there, but the general system is more perfect than that of any other country in the world. A great deal of time has been spent by the salesmen and farmers interested in the manufacturing of cheese in trying to squeeze out the last one-eighth of one-sixteenth or one-thirty-secondth out of their cheese, and they have devoted a lot of time in this direction that might be devoted in other directions. The market will take care of itself, and competition will bring about results.

I am surprised that so much attention has been given by newspaper men and others to this question. If they would devote their attention to other ways in which the farmers could make more money it would be better for all concerned, because after all we are in the cheese business for the amount of money we can make out of it, whether it be the farmer or merchant.

It seems from the experience of the last season or two that high prices do not always mean prosperity. I heard a business man in Montreal say, "You are having a fine cheese year; the farmers must be prospering." But he did not know the conditions. Take this year as compared with last year, and last year as compared with the year before. Every farmer knows what the net result of the season has been. You had high prices, but you had poor pastures, and lack of feed, and the high prices have not brought you in the same money per cow as you obtained the previous year; and you have been obliged to buy a large amount of feed. The farmers are becoming slaves to the mill-owner, and are buying too much mill feed which they ought to be raising on your own farms. (Applause.)

In 1903 the total make of cheese in Canada was just past the three million boxes, in 1906 it was about two million and a half boxes, and this present year it will be only slightly over two million boxes. There is something wrong somewhere. What is it? Perhaps you do not know. I do. We have been spending a great deal of time for a great many years—one speaker says twenty-six years—I might say 40—in teaching the makers how to make

cheese, and we have been learning some of the lessons over again and finding out other and better methods.

We cannot work out any problem and know it all at once, and some things that we think are facts we afterwards find are not facts at all. We have vastly improved in the manufacture of cheese in this country. The Dominion Government and the Government of the various Provinces have been assisting in the manufacture of cheese, and to my mind the majority of men who are engaged in the manufacture of cheese to-day can make a first-class article if you give them first-class milk to make it of. How is it we were making three million boxes a few years ago and only making two million now? How far have you gone during these years in selecting your cows? Let me ask you a plain question: Have you stopped using poor cows?

I would like to see a plan adopted that they are carrying out in Saskatchewan. Why are we sending on milk to all kinds of factories? Montreal and Toronto will not allow milk to come there for consumption without being inspected. They will not allow milk to be delivered in all kinds of cans and receptacles. It has to be handled in a proper and scientific way. How can you expect to get the best quality of cheese out of a small and unsanitary factory? Almost the total quantity of rejected cheese came from the small unsanitary factories, and until you can improve that matter, especially in the eastern part of Ontario and Quebec, you cannot hope to get that first-class article which Mr. Ruddick has been speaking about. The small factories, if carried far enough, will spell ruin to the cheese trade. If we are to hold our own with New Zealand—which by the way is sending near 5,000 boxes—we must have some style to our cheese, we must not use these old heads and have rough edges. We must have them sharp and fine, and we must have the cheese put in proper boxes and we must have the weights stencilled on. There is a very serious matter coming up just now, and that is the loss in weight. It follows with green cheese that is shipped and the large amounts of moisture. In New Zealand they allow two and a half pounds per box of 84 pounds, and the result is that New Zealand cheese will not only stand weight, but it arrives in England and will stand weight for some time after. Our cheese are loosing two and three pounds per box. There must be a greater allowance for weight, or you must hold your cheese a longer time or take less price. We must not only produce more cheese, but we must produce a finer article, and it must keep its weight. A man who is making first-class cheese should not be afraid to put the dates on his cheese, and when that is done that man who is not making equally as good cheese as yours will be obliged to put his date on, and the date will have a great deal to do with the price.

Mr. Ruddick: Would you put dates on the cheese?

Mr. Ayer: No; I never yet received an order for 500 boxes of July cheese; but if we knew the date they were made we would know how long you have kept them in your factory. We have objected to the Saturday Boards, because it creates a lot of inconvenience and the cheese have to be held over for another week. I do not see why every factory in the country should not adopt the plan of numbering their vats; it would save a great deal of trouble if they would do so.

I want to commend cool curing as spoken of by Mr. Ruddick to-day. The people of France and Spain were not aware of the reason why wines produced in the mountains were so much better than those produced in other parts of the world. The fact of the matter was that the wines were kept in cool caves in the country which were virtually cool-curing rooms: and we are only now adopting the same thing in the curing of cheese. Cheese are

held in the cold storage in Montreal, and sold when the market is best; and if they were sold as fast as they were manufactured and placed on the market each season when there was not any great demand the price would decline because you would cause a glut in the market. We are working in the interest of the farmers in the country. What profits you profit us, and what profits us profits the farmers of Canada.

Mr. J. H. SINGLETON: With your permission I would like to present a resolution before the meeting at the present juncture. I want to move, seconded by Mr. E. Kidd, that "Whereas it is evident from the experiments conducted by the Department of Agriculture of the Dominion of Canada as to the best methods of caring for and preserving milk by dairymen for cheese making purposes, as presented by Mr. Barr, a member of the Dairy Department, at the Eastern Dairymen's Association of Ontario (assembled this 7th day of January, 1909), to be for the greatest importance and value for the improvement of the quality and quantity of yield of cheese from milk;

"And whereas it is considered to be in the best interests of the public, and milk producers, that such experiments should be at once publicly circulated to as wide an extent as possible;

"Be it therefore resolved that the Dairy Commissioner, Mr. J. A. Ruddick, be requested to publish in bulletin form and the public press at as early a date as possible the practical results of such aforesaid experiments."

This resolution requires no further explanation. Mr. Ruddick has told us of the importance of cool-curing cheese, and while we do not want to throw any cold water on that, there is no question more important for the dairymen of the country than this cool-curing of the milk; and we have had such an extreme proposition come to us in such an excellent manner this morning by Mr. Barr, that I am sure you will all agree with me that it ought to get the widest circulation. The motion was carried.

ADDRESS.

BY G. A. PUTMAN, DIRECTOR OF DAIRY SCHOOLS, TORONTO.

You will be glad to know that during the past season the work has been the most satisfactory of any yet, and the experience throughout the West is the same as the East. The sanitary condition of the factories have been improved from year to year, and this year the factories, the owners of factories and the makers and producers have all taken a common interest and pride in improving the sanitary conditions of the factories. The factories in the West are larger and many of them are pasteurizing the whey, and we hope to see that feature of the work extended. The makers in the West are better qualified than those in the East, because the factories are larger, and they are able to pay more money. I believe the quality of the milk delivered in the factories of Western Ontario is better than that in the East, and one of the reasons for that is that we have appealed to the women on the farms to take an interest in this feature of the work. We have been able to interest the women through our Women's Institutes, and by sending out lecturers to address them on the care of the milk. The women have seen to it that the men do the work properly. We trust you will have more Women's Institutes in Eastern Ontario. We have a great many more inquiries with regard to this than ever before, and we believe next summer we will have organizations established.

We made a census in Western Ontario, and we find that the average test was only 3.5 per cent. butter fat. I have received reports as to the manufacture of whey better. The factory at Kerwood manufactures cheese and butter, and they were able to make butter from the whey and from the cream taken direct from the milk, and they had an opportunity of comparing the quality of the butter made from the whey and from the milk. It was found that the average quality of the butter made from the whey as compared with that made from the cream separated in the same factory was always lower than when it was freshly made, but when it was kept in cold storage the quality of the butter taken from the whey is not first-class. When it is kept any length of time it deteriorates in value and quality. It will not pay to equip your factory for the purpose of making this butter unless you are getting a very large quantity of milk. It would not pay a company to install the necessary machinery, and it is a very dangerous practice. It puts a premium on carelessness on the part of the maker, and that is the most serious point in connection with this whole question.

Mr. Publow, Mr. Dargavel, and myself have talked over the matter of certificates for makers, and during the past few seasons Mr. Publow has taken a census of the makers in Eastern Ontario, and we have also had one taken for Western Ontario. It is not the intention of the Department or the Association to give out the information to the public, but is valuable information for the Inspectors. In Ontario we seem afraid of legislation. We are set in our ways. It seems easier to put legislation into effect in the new Provinces, and it is quite likely that the Legislature will not pass any legislation unless the men directly concerned in the industry make some appeal to the Government. When the suggestion was made that we should have sanitary inspection of factories and farms some of the farmers were very strong in their appeals to the Department that such legislation should not be enforced. They said they were free citizens and were not going to be compelled to do this or that; but now I do not think you will find any farmers who will say a mistake was made when we introduced that legislation.

We have been successful in getting practical men who enforce the legislation, and I am sure that if legislation were introduced regarding qualifications for makers they would be pleased with it. I do not think we could say that every maker in 1910 should have Dairy School qualification, but some scheme ought to be in force whereby permits could be given and men who have been successful should not be barred out.

I am sure that a more effective system could be inaugurated, and I trust this Association will make some appeal to the authorities that be that such legislation be introduced. I believe some legislation should be inaugurated, that a factory could not be started within a certain radius of another factory without first securing a special permit from the department.

A MEMBER: Would not that be creating a combine?

MR. PUTMAN: I do not think it would be a combine. I think it would map the work out in the best interests of the industry. I was approached yesterday by a representative from Prince Edward County. He said they had expended between six and seven hundred dollars in putting in cold-curing plants, and the farmers a few miles from them are now thinking of putting up a small factory in the hope that they will be able to have their cheese manufactured for a little less. They certainly will kill cold-curing rooms. One of the large factories is hesitating as to whether they will put in ice in view of the fact that some of the farmers are thinking of putting

up an opposition factory, and it seems to me we will never make progress until that matter is regulated in some way.

When you take a large territory and the number of patrons, the number of prosecutions for watering the milk is very very small, and we in the Department are very gratified to know that the suggestions which we made a year ago last spring has worked out so satisfactorily and has not been a bill of expense to the Department or the Association.

CREAMERY INSTRUCTION AND INSPECTION.

By James Stonehouse, Dairy School, Kingston.

The creamery season for 1908 in Eastern Ontario has been satisfactory in some parts and unsatisfactory in other parts. The unsatisfactory conditions existed in the most easterly part and along the Ottawa River and were caused by a lack of pasture, the season being extremely dry from the 1st of June. Between Belleville and Toronto the pastures were up to the average through June anl July and prices were very satisfactory for butter all through the season from the producer's standpoint and undoubtedly unsatisfactory from the consumer's standpoint, as prices have been unusually high nearly all through the year. A great deal more butter found its way to the British market this year than was sent over last year, which tended to stiffen prices for creamery butter. The bulk of the creamery butter made in Eastern Ontario is put into prints and is consumed largely in the district bounded by Montreal and Toronto. Nearly all the creameries in my district are located at easy shipping points, which is conducive to doing a print trade.

I had only one creamery in my district (Maxville) which was exclusively a whole-milk creamery; I had two others, Locust Hill and Peterboro, which separated a portion of the milk at the creamery.

The make of butter throughout my territory was fairly uniform, only one creamery pasteurizing the cream throughout the summer, and the benefits of so doing were very apparent in the finished product. This creamery takes no sour cream and pasteurizes all cream and milk taken in. The custom of collecting cream only twice per week is becoming almost general and from the standpoint of quality this is to be regretted. The cost of hauling has increased so much during the past four or five years that collecting three times per week eats up a great part of the profits where the creamery patronage is small or where the patronage is falling off, as it is in many cases.

Some of the older creameries have suffered a great shrinkage in their output during the last three or four years and they are curtailing their expenses in every direction as much as possible. One cause of the shrinkage is lack of cows. Many cows were sold off during the fall of 1907, and a great many were farrow during the past season. Lack of farm help is another cause and the strong demand for dairy butter is another.

I have found the individual cans giving excellent satisfaction where they have been successfully introduced. The cream seems to come to the creamery in better condition and the maker has a better chance to examine it for quality. The principal objections to the individual can are the extra cost of cans, either to the patron or creamery, and the limited district which can be covered unless they are shipped.

Tanks are used in only two creameries in my district, and they also have their advantages and disadvantages. For long hauls over rough and hilly country they seem to have an advantage, and much more cream can be hauled

on a given number of square feet of waggon bottom than in any other way. Jacketed cans are the most popular among creamery men, as they have several advantages over the other methods. I found a great lack of proper covering for the cans while on the road. I induced one creamery to adopt a canvas covering and the buttermaker reported that the cream from the covered cans came in 4 degrees cooler than those not covered. These covers not only keep the temperature down but they prevent the dust and mud from getting into the cans. This road dust is one of the worst things that can get into milk or cream as it is always laden with germs of a putrefactive kind.

There is a lack of cold storage facilities for keeping butter at a low temperature. I have 28 creameries in my territory and none of them use the salt and ice system. The large majority ship out their product once or twice per week and some ship every day, thus lessening the necessity of low temperatures. Low temperatures, however, are a necessity where the butter is for export. The majority of creameries in Eastern Ontario are particularly well situated to cater to the large consuming centres and they are not paying much attention to the export trade, and for that reason they do not attempt to provide first-class cold storage. There are but few unsatisfactory buildings used as creameries in my district and only four which have not cement floors in their make room, and many have cement all through.

I found a general uniformity in the amount of moisture contained in the butter, usually running from 12 to 14 per cent., but individual cases running from 16 to 20 per cent. Where an attempt was made to incorporate moisture, I usually found the highest test.

The score of the butter for quality was generally not as high as is desirable, and this is accounted for by the cream generally not being kept at a temperature sufficiently low to prevent it from becoming too sour and the cream not being gathered often enough, usually twice per week. The cream is generally handled in good shape after it is received at the creamery, but the buttermaker usually has but little control of his product as the quality is fixed in the cream before he receives it.

I have found that where the cream is made rich and kept at a low temperature at the farm, that it is usually in first-class condition when it leaves the farm. Many patrons of creameries insist upon sending the low testing cream, and I find that the creameries getting a low testing cream usually turn out the poorest quality of butter. The reason for this is that a low testing cream has too much milk left in the cream, and it is the constituents of the milk which sour and decompose and cause bad flavors. A rich cream has less of those decomposing materials in it, and the less we have the less chance there is of bad flavors developing in the cream. It would be a good thing if all cream haulers could be paid according to the amount of fat they bring in, as this would induce the haulers to insist on rich cream from the patrons. Where this is in vogue it works well, as it makes the haulers hustle after cream and they won't carry any more milk than they are compelled to.

In summing up the suggestions I would make for the improvement of the creamery, the first and most important is a richer cream kept at a lower temperature while in the hands of the patron; second, gathered as often as necessary to insure against old flavors; third, pasteurizing to eliminate food and other injurious flavors; fourth, have canvas covers for all waggons that carry cream in cans; fifth, wash farm separators after each milking. Neglecting to wash separators after using is becoming a very common practice and cannot be too strongly condemned. People who consider themselves very clean in other respects are falling into this error along with the most careless.

ADDRESS.

By A. A. Ayer, Montreal, Que.

Mr. Ayer was presented with a beautiful bouquet as he rose to address the audience. His address is as follows: I feel at home when I am among my own class, the farmers, but I confess I feel nervous among so many handsome ladies this evening. I spent my time till I was 21 years of age on the farm, and two of my sons are farmers, and my father and grandfather and great-grandfather were farmers. I would like to have this audience, and especially the young people in it, realize the pleasure there is in doing things. One of the greatest wonders to my mind in the universe is the growth of the grasses and the grains. I wonder how many of you realize that one of the greatest things you can do in this world is to make two blades of grass grow where only one grew before. Do you also realize that the business in which I am engaged has no increase in values. The article does not increase in value because I happen to be the owner of it, and there is no real pleasure in it; but there is pleasure in a business where the article you handle increases in value. Therefore do you wonder that my love goes back to the farm life again, and that I get more joy out of the old homestead than I do in the trading business in Montreal. I wonder how it is that on some farms the buildings and surroundings are clean and well kept and handsome while in others there is the very reverse. The real secret to my mind is the man and the woman. They do not love work: and I am sorry for the man or woman or the boy or girl who has not learned the real genuine love for work. One of the greatest things of beauty in this world are the grain fields—they spell plenty. I am glad that the ladies in these days have taken to wearing green things. They have adorned their dresses with green: and if you look at the trees and the grass when growing and count the shades of green it will give you a lot of pleasure. In the spring when the grass and other things are coming up count how many shades of green you can find, and you will be surprised at the number, and then you will begin to realize the beauty there is in country life,—in the green pastures that produce the food that is so necessary. If we farmers go about our business in a right way, cultivate our farms in the right manner possible, we can make money. The majority of farmers try to farm on too large a scale. They want to plow up 10 acres when they should only plow up 5. We have failed to fertilize the land sufficiently; we have failed to rotate our crops as we should do, and so increase the value of the farm and its productive capacity. We have failed to select the seed. The selecting of seed is one of the greatest factors for success in farm life. We should build silos in which to keep our corn. In the dry seasons, we should have plenty of feed on hand so that our cattle shall not want for plenty of good succulent food.

We have had cheese instructors in Ontario for many years, and we have become almost perfect in cheese making. The Government has spent thousands of dollars, and the farmers have assisted, until cheese making has become one of our chief industries. Why should we not have farm instructors as well? The farmer is behind the factory and why should not each individual farmer have an opportunity of getting instruction? I am afraid we have been just a little above instruction, and some of us think we know a little bit more than our neighbors about these things. I know two farms that are situated side by side, of equal natural value, and on one of which there was more raised in 1906 than in 1905, and more in 1907 than in 1906, and still more in 1908, notwithstanding the dry season, than in 1907, while the neighboring farm

has been the very reverse. The man on the neighboring farm thought he knew it all, while the man on the other farm was teachable, and he is progressing.

I would like to see in each county in Ontario a model cheese factory, and, if possible, a model butter factory; and surrounding these I would like to see model farms. I would bonus that factory with a large amount of money, in order that the neighbors and others in the county might see what could be done in farming, and in making farms beautiful and attractive, and would make it attractive to the young—so attractive that the handsome young ladies in this audience would seek to find farmers' sons for their husbands rather than city men. (Applause). I want to say to the young ladies present, give me a farmer's life. I think I said this afternoon that we were in this business for the money that is in it; but I think I ought to partially correct that and say that we are not in the business solely to make money, but we might make a change and increase our production in this country and still make money. I said this aftermoon there was less cheese made this year than last year, and last year than the year before, and the high price of cheese had opened the door for the New Zealanders and the Dutch and even for the Italians to come and take our customers away from us. Now, we do not want that to be, and the only way to prevent it is to increase the quantity of our product, and in order to do that we must increase the product of our farms.

The wisest Teacher that ever lived gave these words to his disciples: "Go preach, teach"—personal responsibility to them—and that is the word I give to the delegates here this evening. When you go back to your homes, realize that you have some responsibility to your neighbors. Preach to them, and teach them the better way of conducting their farming operations, and lay out your own plans in order that you may do effective work in the coming season. That same Teacher gave as the greatest of all the commandments: "Love thy neighbour as thyself." I am afraid we are living a selfish life, and living for self and forgetting all about our neighbors. Would it not be a grand thing for us to go forth from this Convention with a definite plan? Why cannot this Convention be better than all previous Conventions by having a definite plan to carry out by which all the farmers of this country will become enthusiastic over doing better work for making their homes more beautiful than they have ever been before—attractive to our young people, so as to reverse the order of things and attract the young people from the cities to the country, instead of from the country to the city. That ought to be the order of things, because back to the simple life is back to the joyous life, back to the healthy life, back to the working life, back to the life where we get nearer to God and nearer to nature than we can possibly do in the great cities. (Applause). Every butter and cheesemaker in this Province ought to be a centre from which should radiate instruction to the patrons of the factory; they ought to create an enthusiasm among their patrons to do better and more effective work.

At this juncture the Mayor of Prescott was presented with a handsome bouquet by a young lady, on behalf of the Association, to which he made a very suitable reply.

THE CHAIRMAN: I have now much pleasure in calling on a gentleman whom I am sure is no stranger to this audience, Mr. Howard Ferguson, the member for Grenville. I have been perhaps unfortunate enough to have a seat in the Ontario Legislature for the last four years, and, representing the Dairymen's Association, they have looked to me to champion their cause. During my term in office I have had no more devoted ally in the House than Mr. Howard Ferguson. It might seem strange that in a House where

there are a number of farmers that I should have to look to a lawyer for assistance in this work; but I can assure you that when the farmers get into Parliament most of them get lazy, and do not have that interest they should have in the claims of their constituencies. I have heard the remark made in rural constituencies that they should elect a farmer. That is all very well; but, somehow or other, it is my experience that it does not work out as some people think it should. We have citizens who have been brought up in rural communities who thoroughly understand the wants of rural constituencies, just as much as many men who happen to live on a farm. I would rather see more people of this country living on farms, but I do not think that gives them any more interest in the wants and welfare of the farmer than a bright, sharp man who has been brought up in the country. If I want anything for the Dairy Association, all I have to do is call on Mr. Howard Ferguson to assist me and he will go at it often times much better than I could myself. I have therefore much pleasure in calling upon Mr. Ferguson to address you.

ADDRESS.

By G. Howard Ferguson, M.P.P., Kemptville.

I came here to-night, not for the purpose of making an address, but to show my interest in the grand work that is being carried on by the Eastern Dairymen's Association in connection with the farming industry, and particularly to congratulate the Dairymen's Association and you upon the magnificient gathering that was held here yesterday and to-day. Unfortunately, I was unable to be here yesterday, but I am told you had a splendid meeting. When the President of the Association first intimated to me that it was suggested they should come to Prescott for their meetings, I assured them they would receive a hearty welcome here, and I am glad you have put forth special interest on behalf of the largest and most important industry in this country. I know that Prescott appreciates a good entertainment, because I have spoken here myself at several lively entertainments. (Laughter.)

I claim to be somewhat of a farmer. I have ten acres of land, and I know that over five acres is always taxed as farm land. At any rate I am interested in anything that interests the farmer. Three-quarters of the people of this Province are engaged in the farming industry, the other one-quarter are only parasites living on these farmers; and it behooves them to see that they get along, because we have to live off these fellows, and for that reason so long as I have to farm the farmers I want to see the farmers succeed. Three-quarters of the people in this Province are directly interested in the farming industry, and the other quarter are just as much interested. There is no business under he sun that will show such grand results from intelligent application as will the farming industry. I venture to say there is not a man in this hall but can put his finger on a farmer who is almost starving, and his family practically in want, and he is on a good farm, while his neighbor with intelligence has succeeded in paying for a very poor farm and making a success. The first feature to look at is to find out for what your soil and locality is adapted. The natural conditions seem to show that in this Eastern part of the Province the industry that will give the best results is dairying. You were told this afternoon

by Mr. Ruddick that three-quarters of the dairy product of Canada comes from Ontario, and almost three-quarters of that comes from the Eastern part of Ontario. I think he told you that some 80 per cent. of the dairy product of Great Britain came from Canada. What does that means? It means that we should look at this problem seriously. There are two features to be borne in mind—the farming business is just as much a commercial enterprise as any other business can be, and the farmer should look at it in that way. The central point you should keep in view is the making of money out of the farming industry. There is the quantity of the product and the quality. After paying some attention to the matter, I have come to this conclusion: We have no trouble about quantity of the product. That depends on the classification of the stock, and the way you feed them, but you may over-produce if you have not got the quality, because you cannot get the market. Therefore the important point is the quality, because if you produce the best quality of cheese and butter you will always have a demand for it, and you cannot over-produce if you can compete with the rest of the world successfully. In almost every other branch of food production we are more particular than in the cheese industry. I pass farms day after day where the man has a well in his barnyard, and another at his back door. He won't take a pail of water to make tea from that barnyard well, but he will water his cattle and wash his milk pails with it, and then he expects to take good milk to the factory.

I have always been glad to second the efforts of my good friend, Mr. Dargavel; he has been untiring in his efforts to bring about beneficial legislation in the interests of the farmers.

Complaints have been made about our being burdened with inspectors and instructors. Somebody has said that people should be, in a commercial sense, allowed to do what they liked, and allowed to send milk to any factory and pay what they like for the cheese and that sort of thing; that competition should be allowed to run rampant in this business; but that is not the doctrine to which I subscribe. I think we need protection in this particular branch of food production, perhaps, as much as we do in anything else. They inspect your bake shops and your slaughter houses, and why should not they inspect your cheese factories? Why should you not insist upon having cleanliness and sanitary arrangements on one of the most important products that we manufacture in this country to-day?

Your financial prosperity depends upon the quality of the product more than on the quantity, because, unless you produce the quality you can produce the quantity, but you will not find a market for it.

The CHAIRMAN: I now have much pleasure in calling upon Dr. Robertson, of St. Anne de Bellevue College, Quebec. It would be entirely uncalled for on my part to say anything about Dr. Robertson except perhaps to some of the younger people in the assembly. Dr. Robertson has done more for the dairymen of the Province of Ontario and for the Dominion of Canada than any other man, and he is still carrying on the work. I am sure you will all enjoy his address and we feel very grateful to Dr. Robertson that he has consented to be with us to-night and deliver an address.

ADDRESS.

DR. J. W. ROBERTSON, ST. ANNE DE BELLEVUE COLLEGE, QUE.

Dr. ROBERTSON was presented with a handsome bouquet on rising to address the audience, and opened with a few jocular remarks. He then went on to speak of dairy education, and the benefits that resulted from co-operation in the making of cheese and butter, and placed particular emphasis upon the enlargement of vision that came to farmers from meeting together in conventions and other agricultural gatherings. Canadians should rejoice in the fact that they were the freest of men, and were not like the moujiks of Russia. He pleaded for methods of education that would make the land more beautiful and attractive, and thus keep our boys and girls upon our farms. He also advocated manual training in public schools, as it was well to let our boys know from the start that they were expected to be workers. It was thus that human life was to realize its highest conceptions.

RESOLUTIONS.

Moved by T. A. THOMPSON, seconded by R. G. MURPHY, "That, whereas the success and educational value of this Convention is largely due to the presence of the speakers who have so ably addressed our meetings, we desire to express our sincere thanks for their kind assistance and presence throughout the various sessions." Carried.

"That we the members of this Association desire to express our appreciation of the kindness of the Mayor and Council, members of the Board of Trade, and citizens of Prescott in furnishing the use of the Town Hall free of charge to the Convention." Carried.

"That the thanks of the Convention be and they are hereby tendered to the Canadian Salt Company of Windsor, Ontario, through their general Manager, Mr. Henderson, for the very handsome badges presented by the Company to the members of this Association." Carried.

"That we as dairymen feel that we are under great obligations to the Department of Agriculture for the assistance they have rendered the dairy industry of Ontario." Carried.

"That as an Association, we wish to express our satisfaction with the work of the special officers appointed to take charge of the work regarding the adulteration of milk, and we recommend to the Board of Directors for 1909 the continuation of their services." Carried.

"That this Association wishes to express its gratitude to the several railroad companies for their kindness in reducing rates from all points to Prescott, during this Convention." Carried.

Moved by Senator DERBYSHIRE, seconded by C. D. RUDDICK: "That this Association recognizing the great value of the present campaign instituted by the Dominion Government in favor of a large milk yield from better cows, urge upon the Dominion Minister of Agriculture the great need for a rapid extension of the work of the Testing Associations." Carried.

Moved by H. GLENDENNING, seconded by T. A. THOMPSON, "With a view to improving the position of cheese and butter makers, in Ontario,

and also to place the owners and managers of factories and creameries in a position to secure well qualified makers, this Association in convention assembled respectfully request that legislation be enacted, setting forth the qualifications of makers, who may be allowed to take full charge of the manufacture of either cheese or butter. It is recommended that a full census be taken of the makers and helpers, during the season of 1909, and that certificates of efficiency be issued to those who are considered qualified for the season of 1909, and that for the season of 1911 only those who receive certificates be allowed to occupy positions as head makers.

"We beg to recommend that a committee be appointed by the directors of this Association, to co-operate with representatives of the Western Association, in recommending basis upon which permits or certificates be issued." Carried.

REPORT OF NOMINATING COMMITTEE.

The report of the nominating committee was received, and on motion of Mr. H. GLENDENNING, seconded by Mr. Jas. WHITTON, was adopted. The list appears on page 5.

The CHAIRMAN: I believe it is a fact that every one of these names are names that have been nominated at the several district meetings that have been held. There is a little misapprehension on the part of some people who imagine that at these district meetings the directors are elected. They are only recommended to the Association, from the fact that nobody has a vote as to who the directors will be except he is a member of the Association. It would be an absurdity if the people at large had the privilege to elect the members of the Association when they were not members. A man who took considerable pains to get himself elected last year, because he thought there was some pay attached to it, when he found that it was only a labor of love and nothing but the expenses were paid, sent in a letter declining the honor.

SECRETARY'S REPORT.

BY R. G. MURPHY, BROCKVILLE.

I have the pleasure, as your Secretary, in presenting my annual report for the year 1908.

I need not enter into the history of the growth of the dairy industry since 1864, when the first cheese factory was situated in Canada, nor since the organization of the first Dairymen's Association in 1867, but it goes without saying that it has proved to be an industry peculiarly adapted to this country, and one which we can boast of as having made remarkable progress. Our cheese still occupies the proud position of being the largest amount sent to the markets of Britain, of all the countries of the world, and has a reputation in these markets that other countries envy. This enviable reputation has been obtained by education through various channels, among which are dairy schools, dairy instructors, sanitary inspectors, the holding of special dairy meetings, the disseminating of dairy literature and the holding of conventions, such as this, all of which have been liberally assisted by the Department of Agriculture of the Ontario Government. The Department at Ottawa was not slow in recognizing the importance of assisting in building up this reputation by giving us better transportation facil-

ities and in other ways. But the various methods we have adopted have been taken up by other countries and some of them are already our competitors. If Canadian dairymen wish to continue to lead they must continue this education. We cannot stand still; we must keep advancing along the lines set forth in the wise and practical counsels given at this Convention. Education is a slow process, but many of the things said here will bear fruit, and no man need apologize for having taken part in the deliberations of this Convention, which, together with the thirty-one others which have preceded it, have done so much for the upbuilding of the dairy business in this country. In view of what has been accomplished by this Association, backed up by the Government, past and present, many men can, without boasting, say "We are proud of what has been done." I know there are a few who are skeptical in regard to the good accomplished by this and kindred Associations, but I believe it is because they misconceive the real functions of this institution. The directors do not claim for it perfection, but they do claim that it has assisted the dairymen of this country, by furnishing them with facts for their instruction, and they have, in turn, adapted them to their particular circumstances, and thus been able to produce a better product. The assistance thus rendered has not come too soon, for there is a demand calling louder and louder for better cheese and butter, and, in order to produce it, we must help the manufacturer to call louder and louder for better milk. Higher grades of dairy products require higher and better grades of milk.

Much good along this line has been accomplished by the holding of about twenty dairy meetings during the months of November and December, which have been exceedingly well attended in most instances. Speakers who are practical men have been sent to these meetings by the Association, and by this means the men who do not attend Conventions like this, men who read little and think less, men who have got into a rut, have been reached, and we are looking for results. It is the careless, indifferent men we have been trying to reach through these special dairy meetings, feeling that others would look after themselves, although constant watchfulness is necessary lest the best of us find ourselves in a similar rut. We must plan and labor, agitate and educate, continue to devise the ways and means by which we may be able to maintain the proud position we now hold in supplying the British market with the largest share of her imported dairy products.

Men, who want to know more about their business, have attended the sessions of this Convention, and if, by having listened to the advice and counsels given by the various speakers, they are able to take home with them a higher ideal than they had before, the seed, which, if sown, will grow into better conditions, then the work of this Association has not been in vain.

It is no idle boast when I say that this Association has done a great deal to encourage the industry and place it in the position it occupies today. It has worked in unison with, and encouraged, in every way, the Dairy School at Kingston, which has done such a noble work in the education of our makers.

The annual reports of our Association have also been the means of disseminating much valuable information in respect to all branches of dairying. I regret that more farmers do not belong to the Association and take advantage of the benefits it offers. A tribute should be paid to the zeal which some of our friends have displayed in encouraging and promoting the dairy industry in this part of the Province. Some of them have been in the forefront of the struggle to attain better things and secure a higher

standard of efficiency in dairy farming, and their aid has been invaluable. But it will require the united and best efforts of our Association, of our Dairy School, of the Inspectors, factorymen, farmers and shippers together with the help of the Departments of Agriculture at Toronto and Ottawa to keep our dairy products in the front ranks.

In my opinion, annual gatherings, like this, of men from different localities, who are engaged in the practical work of the industry, have an educational value, which should be appreciated. Some men, engaged in this business, who keep on their way by themselves regardless of what others are doing, may know a great deal more, and very often a great deal less, than they think they do, but when they hear what other people have done, with the reasons, explanations, and conditions of courses followed, they are in a better position to judge of the soundness of their own ideas. And, even if they are half way intelligent, or progressive men, they can hardly attend one of these meetings without getting their eyes opened to some weakness in their own methods or see some chance for improvement; while, at the same time, they may be able to give information on points that will be new to others. There is no work upon the farm where people vary so much in results as in dairying, hence the need of further education along these lines.

The work of the Association was very ably outlined in the opening address of our President, and I have but little to add.

At the various special dairy meetings held throughout the eastern part of the Province, men were named to represent the various districts upon the Board of Directors for the year 1909. By this means, the board is composed of men, selected by the voice of the people, who attend these meetings. Every farmer, farmer's son, cheese maker, cheese manufacturer, salesman and buyer, who resides in the county where the dairy meeting is held, has a voice in the selection of the man who shall represent them as director upon the board.

The following are the names of the gentlemen, who have been selected by the vote of the people, to compose the board for 1909, and the county or counties they represent.

John H. Singleton, Smith's Falls, Renfrew County.
Neil Fraser, Vankleek Hill, Prescott County.
Edward Kidd, North Gower, Carleton County.
Napoleon Longtin, The Brook, Russell County.
John McGregor, Alexandria, Glengarry County.
P. McDermid, Avonmore, Stormont County.
C. F. Whittaker, North Williamsburg, Dundas County.
James A. Sanderson, Oxford Station, Grenville County.
John R. Dargavel, Elgin, Leeds County.
T. A. Thompson, Almonte, Lanark County.
Joseph McGrath, Mount Chesney, Frontenac County.
W. J. Paul, M.P.P., Tamworth, Lennox and Addington Counties.
James Whitton, Wellman's Corners, Hastings County.
Alexander Hume, Menie, Northumberland County.
G. A. Gillespie, Peterborough, Peterborough County.
A. S. White, Sydney Crossing, Prince Edward and part of Hastings County.
Henry Glendinning, Manilla, Ontario, Durham, Victoria and Haliburton Counties.

In addition to those named there is Hon. Senator Derbyshire, who was made honorary president, and Chief Instructor G. G. Publqw, who is named to represent the cheesemakers of eastern Ontario. These are the gentlemen,

who have been named to look after the interests of the dairymen of eastern Ontario, for the coming year, and I hope to see their selection confirmed by the unanimous vote of this convention.

Your board of directors of last year found it necessary to appoint two public prosecutors to help in checking the wide spreading practice of sending adulterated milk to factories, and Messrs. Frank Brenton, of Belleville, and Alfred Street, of Kemptville, were selected for the work. They both proved themselves men well qualified for the positions and their work was very satisfactory to your board.

I therefore append a list of our members for the year 1908, each of whom were entitled to a copy of the official organ of the Association, known as the "Canadian Dairyman and Farming World," the name of which is changed to that of "Farm and Dairy" for the present year. Each of our members for this year will be made subscribers of this journal, which is published weekly in the interests of farm and dairy as its name indicates.

I have discharged the duties of secretary devolving upon me during the year just past with such ability as I possess, but the task has been lighter than it otherwise would have been on account of the kindness and forbearance of a well wishing board of directors, which were always ready and willing to lend their assistance. To them I tender my thanks for their kindness.

The CHAIRMAN: It has been moved by Senator DERBYSHIRE, and seconded by Mr. KIDD. "That the very able report we have had from our Secretary be adopted. I am sure we are pleased that we have a Secretary who is able to give us such a very complete report as we have had here to-day. It takes a few months to get the report printed and distributed, but they all come around in time, and I am sure it will be quite an addition to the records of the Association." The report was received and adopted.

Moved by Senator DERBYSHIRE, seconded by E. KIDD, "That this Association having heard with regret of the resignation of Mr. J. W. Mitchell, as Superintendent of the Kingston Dairy School, desires to place on record its deep sense of approval of the excellent, effective and valuable work accomplished on behalf of the dairy interests of Ontario by Mr. Mitchell during the many years he was connected with the dairy interests of this Province, and to extend to him our hearty congratulations upon his appointment to that important position that he now holds on the staff of the Manitoba Agricultural College, and to wish him all possible success in his new work." Carried.

AUDITORS' REPORT.

We, your auditors, beg to report that we have examined the books and vouchers of the Treasurer of this Association, and are pleased to say that we have found them correct in every particular. We find the

Receipts	$5,377 19
Expenditures	5,150 09
Balance cash on hand	$227 10

The following shows the assets of the Association:—

Stock in Farm and Dairy	$1,000 00
Cash on hand	227 10
Typewriter	25 00
We found the Treasurer holding	$1,252 10

Vouchers for every item of the expenditures during the year, all of which were produced and examined by us. We found the Treasurer's books cor-ectly kept as well as neatly. All of which we respectfully submit for your ipproval.

J. A. KERR, Auditor for the Association.
JOHN HYATT, Auditor for the Directors.

REPORT OF THE ACTING OFFICIAL REFEREE FOR BUTTER AND *CHEESE AT MONTREAL, 1908.*

BY JOSEPH BURGESS, OFFICIAL REFEREE, MONTREAL, QUE.

In making a report on the official referee work from July to the end of he season, I may say that I gave certificates on 115 lots of cheese, contain-ng 5,486 packages, and 40 lots of butter, containing 1,540 packages. I also xamined a few lots of cheese without orders from the salesmen and reported c Mr. Publow on the quality. I found 13 per cent. of the cheese examined irst grade, 81 per cent. second grade, and about 6 per cent. third grade and ulls. The chief defects in the second and third grade cheese were as fol-ows: *85 per cent. of the lots had one or more batches "not clean in flavor,"* eferred to on the reports as "not clean," "fruity," "off flavor," "yeasty or assy," "rancid," "sour-milk" and "food flavor"; 50 per cent. contained atches open or loose in texture; 33 per cent. with too much moisture; 23 er cent. acidy and mealy; 8 per cent. acidy and moist; 20 per cent. uneven r too pale in color; and 29 per cent. uneven in size, stained ends and poor nish.

Objectionable flavors is the most serious defect, which is, no doubt, argely due to the condition of the milk when delivered to the factories. Then ome of the lots had too much moisture, which would make these flavors more ronounced, especially in fruity and off flavored cheese. A small percentage *eferred to as "sour milk flavor" seemed to be caused by strong flavored* arters, while 4 per cent. were described as "food flavors."

I frequently found that when a lot was open and loose, one or two atches showed "sweet holes," and I judge from this that some of the mak-rs were running their curds a little on the sweet side. Salting the curds o soon seemed to be one of the main causes of this defect.

From the 15th of September, many of the lots were soft and pasty, or ntained too much moisture, indicating that the curds had not been suffi-ently cooked or stirred dry enough. I suppose one of the main reasons for is was the scarcity of water, which would decrease the milk supply and crease the fat making it necessary to give the curds a more thorough oking.

Then we had acidy and mealy texture with pale color, which are rather mmon defects in the hot weather. There were also a few lots with a dry, ugh texture, or cheese that seemed to be lacking in fat, showing over oking and heavy salting.

Later on in the season, we had acidy and moist cheese. I can under-and that acidy and mealy texture might be due to over-ripe milk and avy salting, but this latter defect seemed to be caused by bad management the making.

On the whole, the finish of Ontario cheese was fairly good. There were few lots with stained and checked ends, and during the fall some of the eese did not seem to have been turned in the hoops in the morning. A

few lots were uneven and undersized, and I generally found that these small cheese had too much cotton over the ends, with the boxes considerably higher than the cheese. If the boxes are large enough, the cheese should be made to weigh between 80 and 85 pounds. The weight should be put on neatly with a stencil near the lower band and close to the lap on the box.

I found 32 per cent. of the butter examined first grade, and 68 per cent. second grade. The chief defects were in the flavor and color. Nearly 90 per cent. had one or more churnings "not clean;" about half of these could be described as an "old cream" or an "over-ripe cream" flavor. 40 per cent. contained packages which were either mottled, cloudy or irregular in color. During the hot weather a small percentage of the lots were greasy, showing high temperatures in churning and working. 19 per cent. were not finished neatly, and a few lots had mould on the parchment paper.

At the Eastern Dairymen's Convention last year, Mr. Barr referred to the system of inspection in the warehouses, and recommended a system of numbering the different batches of cheese and churnings of butter. He stated that the present system of selecting a small percentage from a shipment and judging the quality of the whole lot by these few samples was not in the best interests of the trade and did not seem to be fair either to the buyer or the seller. I quite agree with this, for I believe that many lots are passed which contain some packages not up to the standard, while on the other hand, whole shipments are turned down or objected to when only one or two batches are not right. The inspector cannot tell whether he has a representative lot or not, and personally, I think it is one of the most unsatisfactory jobs I ever tackled, to attempt to give a fair report on the quality of 50 or 100 boxes of cheese by examining 8 or 10 packages when the only marks on the cheese or boxes is the factory brand and the weight. If the different batches were numbered, one could see a sample of the whole make and give a correct report on the quality, and if the percentage of faulty packages was not too great, these could be picked out and the cut in price made only on those of inferior quality. I regret to say that the cheesemakers did not seem to approve of this system, because I only found 4 lots with the boxes numbered and such a high percentage of these were faulty, varying from 69 to 100 per cent., that I classed them as second grade; but let me tell you the experience of the buttermakers. 18 per cent. of the lots or 32 per cent. of the total packages were numbered. Now, 70 per cent. of these, and only 12 per cent. of the unnumbered packages were classed as first grade, which should be sufficient evidence to the buttermakers at least that numbering the packages is a great advantage and that it rests with them to put the system of inspection on a more satisfactory basis.

I do not know any reason why it should not be just as great an advantage to have the batches of cheese numbered. As a matter of fact, only three lots of cheese were classed as straight first grade, and by picking out one and two batches in 12 lots, it raised the percentages of first grade cheese to 13 per cent. of the total. Some of these lots had the date on the cheese and by taking the boxes off the samples I was able to see a fairly representative sample of the lot.

In dating the cheese, it would be much better to put the date on the end. Then it would not be necessary to take the boxes off to look for the distinguishing mark. But the only proper way is to number the boxes, which should not take a great deal of time if you have a set of one-half or three-quarter-inch rubber stamps. If you have two vats, number the first day's make 1 and 2, and the next day 3 and 4, and so on until the end of the week. It is only by adopting such a system as this that you can expect to get an

accurate report on the quality, and it should put the system of inspection at Montreal on a basis which would be fair to all parties concerned.

In closing, I want to make one or two suggestions in connection with grading cheese and butter. The first is that there should be an understanding between the dealers and salesmen in regard to the maximum percentage of numbered packages which might be faulty and yet make a distinction in grading. At the present time there does not seem to be any understanding or rules for the guidance of the referee, and the question arises, would it be fair when 70 or 80 per cent. are defective in quality to make any diference in the grading?

The second suggestion is that a change be made in a clause in the standards for grading cheese and butter, which reads as follows:—

"If there are not more than 15 per cent. of defective cheese in any lot, the inferior ones may be sorted out and classed sep^rately. If more than 15 per cent. are defective the classification may apply to the whole lot."

Now, 65 per cent. of the lots I examined contained under 49 boxes. If one cheese in the samples was faulty, it meant that one batch was wrong, which would be more than 15 per cent. of the total, and I would suggest that 15 be changed to 17, which would allow for one batch being defective. In cases where cheese are numbered or dated on the ends, so that the different batches can be picked out by taking the covers off the boxes, I think this percentage should be increased to allow for two batches being defective.

The change from 15 to 17 is not of very great importance and it would not have any effect on the grading during the past season. The main object in referring to this clause, is to suggest that the percentage should be increased to allow for two batches being defective in lots which have a distinguishing mark on the end of the cheese.

A MEMBER: Do you think it would be a good way to number the cheese or just to put the number on the box.

Mr. BURGESS: The number should be on the box, because, when they are taking the cheese into the warehouse it is easy to set one box to one side. If the number were on the cheese it would be necessary to take off the covers. It would be a good idea to have the cheese numbered as well as the boxes, because if the boxes happen to be taken away they might possibly get mixed up. They should be numbered just as soon as they are put into the curing-room.

A MEMBER: Do you think there would be any danger of the stamp rubbing out after it is put in the curing-room?

Mr. BURGESS: I have made cheese for fifteen years, and I never made a cheese that I did not date, and I never found it rubbed out.

A MEMBER: Do you number each vat as it is made daily? Suppose you had ten or fifteen cheese would you put the number on each vat?

Mr. BURGESS: If you had three vats the first day's cheese would be one, two, and three and the next day's cheese three, four and five.

A MEMBER: There are a number of factories that only make one batch a day, and other factories make thirty vats a week, and I do not think your percentages would be right.

Mr. BURGESS: A factory that is using one vat would probably make seven or eight cheese, and there is no reason why the man that has a large factory should have an advantage over the man in a small factory; because. you cannot make over eight cheese in a vat. I do not see how it would make any difference.

A MEMBER: A small factory would only be making six batches a week, and you suggest picking out two batches.

Mr. BURGESS: The same number works on the present percentage; it would refer to small factories as well as large. I do not propose it should refer to small factories alone. If there is any better suggestions, I would be glad to hear it.

Senator DERBYSHIRE: I am glad to say that any reports Mr. Burgess has made, when it has been carefully examined by others has been found to be perfectly satisfactory, and we feel satisfied that the work he has done has been of great advantage to the people of Eastern Ontario. When we have got a report on the cheese that has been sent to Mr. Publow with the speed of an arrow, the inspectors at the factory have a chain of communications, so that we can send direct to any man who is making poor cheese in any part of the district. The very first lot of poor cheese that comes to Montreal is reported to the Chief Inspector. I think Mr. Burgess is an important official, and his report is important and I am surprised that a great many more questions are not asked; because, in the summer time we have murmurs from the boys about this official referee. Now is the time to talk to him face to face.

Mr. BARR: When Mr. Burgess was appointed he had my sincere sympathy. There is one thing about his report that I like very much, and that is the fact that he did not examine as many cheese as I did; and that shows that cheesemakers are doing better work than formerly. I often felt uneasy and dissatisfied sitting around in Montreal with nothing to do; but I knew as long as I sat in the chair it was a good thing for the makers in the country. I am very glad that Mr. Burgess had not as much to do as I had; it is a good thing for the business. We will still need to have a man there to do the work, but I would only be too glad as the seasons roll on if it will be unnecessary to have anybody in the position. That is what we hope for. There is just one thing about this work that I regret, and that is the fact that the cheesemakers and buttermakers of Ontario have not seen the advantage of marking each batch of cheese and butter. We cannot give an accurate report until they do so; and if you were down there for a little and saw what you felt in your bones was wrong, and that you could not assist simply because you could not get at these cheese to examine them as you wanted to, then you would see the necessity for having the cheese marked. I suppose some makers hope that they will have a batch that will slip through. I think that is dishonest.

Senator DERBYSHIRE: If you slip through a lot it comes back to you from England. Every one of these cheese is numbered and marked and it will come back to your factory, and it will be known what you are doing. You would not believe that a man would fill cheese in 1908. I do not believe there is a man here that would have thought that anybody would be so stupid as to fill cheese in 1908, and yet we had one factory that did it, and the cheese were shipped to London. I will tell you how the thing was done. He had a batch of poor culled cheese, and he cut them up and put a chunk in the centre and filled the sides and top and bottom. The people in England and Montreal wanted to arrest him for fraud; but he was a good customer, and I could not afford to have any trouble with this man. I called him up by telephone, and told him I had a very bad report. I had him come in, and he said, "If there is anything wrong settle it and I will fix it up." I told him it was a serious matter; that I know positively he did this thing, and that $200 would settle it. It was settled, and there has not been a word about it; and I want to say to you how foolish he was in doing such a thing. If he had numbered the vats, that lot could have been selected out and set to one side. Do not put your brand on a poor cheese; send them in and sell them for what they will bring. I have had some cheese from a

Dairymen's Association of Western Ontario.

ANNUAL MEETING.

The forty-second Annual Convention of the Dairymen's Association of Western Ontario was held at Brantford, on January 13th and 14th, 1909.

All the meetings were largely attended by patrons and cheese makers and factory owners; much interest was taken in the different lectures and addresses, and the Convention was a decided success from an educational standpoint.

PRESIDENT'S ADDRESS AND DIRECTORS' REPORT.

BY JOHN BRODIE, MAPLETON.

It is my privilege as President of the Dairymen's Association of Western Ontario to welcome you to our forty-second annual convention. Your presence here to-day indicates your interest in this great industry. In looking over the past reports of our Association, I was particularly struck with the sacrifice of time and money made by the old pioneers of dairying in order to secure information that would enable them to build up this industry on a sound basis and manufacture an article of fine quality. It has been pointed out many times that the success of the great dairy industry is largely due to the work of education and assistance given by the various Dairy Associations and other societies. Not so many years ago the Canadian output of dairy products was rather insignificant, when compared with some other countries, but to-day it holds a place second to none, and in order to retain its position in the markets of the world it is absolutely necessary that all interested in the production of dairy products should keep abreast of the times, and place on the market nothing but a finished article that will meet the requirements of an ever increasing discriminating public.

When the British market began to recognize Canadian cheese and butter, the Provincial Governments immediately took steps to aid the industry. By practical legislation, means were put at the disposal of the makers and producers to enable them to produce an article that this market required.

Agricultural societies were started, the Agricultural College was built, Dairymen's Associations and Dairy Schools provided, and finally during the past five years a thorough system of dairy instruction and organization was adopted.

The Federal Government also legislated to improve the transportation facilities of dairy and other farm products by a more complete system of cold storage and transportation on railways and steamships, and doing everything possible to place these products on the world's market in the best possible condition. Every aid has been given so that the finest goods might be produced at the smallest cost.

We desire to express our appreciation of the interest shown by the Hon. Ministers of Agriculture for Ontario, both past and present, in the welfare of the dairy industry, and to acknowledge the substantial financial assistance

which the Government continues to place at the disposal of the Association. We also wish to acknowledge and show our appreciation of the adoption of the present system of dairy instruction, which we believe to be one of the greatest advanced movements in the history of the industry, helping us to produce a superior and more uniform quality; and this, we are certain, will in time, if continued, place our cheese and butter factories in a sanitary condition equal to if not superior to those of any other dairy country, and will bring about the needed improvement in the milk supply as well as continue to improve the quality of our dairy products.

According to the trade returns, it is shown that the amount of cheese exported from the whole of Canada for the season of 1908 is reduced about 154,000 boxes. This is no doubt due to unfavorable climatic conditions which prevailed in different parts of the cheese producing sections, both in 1907 and 1908. Increased home consumption has had a marked effect on the exports, particularly that of butter. The increased consumption of milk and cream in our various cities whose population is rapidly increasing also has its effect. Notwithstanding this decrease in export trade the producers received through higher prices nearly as much total money.

From Census Statistics Bulletin 7, we find that for the Province of Ontario, from the year 1900 to the year 1907, there was a decrease of the total amount of cheese made in Ontario, amounting to 1,137 tons, but while the value of the larger quantity in 1900 was $13,440,987, that of the smaller production in 1907 was $15,106,030, or $1,665,043 more, owing to the larger price obtained per pound. In the manufacture of butter we find that in the same period there was an increase of 651 tons, with an increase in value of $592,522. However, we wish to emphasize the point, that it is not so much an increased price that we should look to for future increase in profits but an increased production from the individual cow.

Coming now to Western Ontario, with which we have more particularly to deal, we find that in 1907, we produced 16,827 tons of cheese and 2,932 tons of butter. From reports of the Instructors and from other reliable information, we find that although two more milk condensers were established in our best dairy districts in 1908, still the production of cheese was maintained and in some sections increased, and the production of butter increased by 338 tons.

We can therefore assure you that the production of cheese and butter in Western Ontario in 1908 shows an increase rather than a decrease.

Several new factories will be erected before the next season opens, some of these in sections where formerly the co-operative factory system had not to any great extent been in vogue; but we must deplore the fact that several of these factories are to be built in sections already well served by existing factories, and we fear that the building of these small factories in districts where the facilities seem adequate is not in the best interests of either the producers, manufacturers, or the trade in general.

Notwithstanding anything that may be said or written to the contrary, we believe that the raising of bacon hogs is a profitable adjunct to the cheese and butter making industry, and when combined is the most remunerative and staple branch of agriculture in practice in Western Ontario at the present time. We, therefore, beg to point out to the producers of milk that it would be well to think seriously and look into the matter closely before discarding the bacon hog industry.

It might here be mentioned that some attempt has been made by a few factory men during the past year to introduce a system of manufacturing skim milk cheese. So far as we can learn the enterprise has not been successful from a monetary standpoint, either to producer or manufacturer, and we

wish to place on record our disapproval of such a system, as it is only by the production of the highest quality that we can hope to maintain our prestige as a cheese producing country.

The prospects for the future of the dairy business in Western Ontario are bright, and so long as we can furnish goods of satisfactory quality our dairy products will continue to meet the approval of the consuming public, both at home and abroad.

Your directors decided to again hold a cheese and butter exhibit in connection with this Convention, and a large number of entries shows the appreciation of the members as far as this feature is concerned. It is generally recognized by every person in the trade that the yearly dairy exhibition is an educative feature along the lines of uniform manufacture. We feel that the general fine appearance of Western Ontario cheese and butter when marketed is due to some extent at least to the educative influence of these dairy exhibits.

The Dairy Herd Competition was continued, the Association donating $100.00 in cash prizes. The number of entries are not large, but it is believed the benefits of this competition are widespread, and has been a means of stimulating the patrons of factories to a greater production of milk per cow, and gives an object lesson of what may be accomplished in the way of profits by proper feeding and keeping cows of heavy milking capacity.

The Ontario Department of Agriculture very kindly allowed us to send out speakers to annual meetings during the winter of 1907 and 1908, and this work has accomplished much good. The Department paid for services of the speaker, and your Association paid the travelling expenses. This work will be continued this year.

The system of handling cases of adulteration of milk worked out so well, that the same system was continued. A special officer was appointed to deal with these cases, and the work was carried on along similar lines as last year.

In conclusion your directors wish to emphasize the idea, that in order to accomplish many things we must have an ideal to which we wish to attain. At the beginning of a new season, at this Convention let that ideal be "perfection." We must adopt modern dairy practice. New discoveries are being made in every profession; yesterday's information will not do for to-morrow's emergencies. Always remember that the world generally gives its admiration not to the man who does what no person else ever attempts to do, but to the man who does best what the multitude do well.

We trust you will have a profitable and enjoyable time while at this Convention.

The CHAIRMAN: I have very great pleasure in moving the adoption of this report.

Mr. PAGET: I beg leave to second the motion.

The motion was carried.

FINANCIAL STATEMENT.

The financial statement was read by Mr. FRANK HERNS, and upon motion of Mr. J. J. PARSONS, seconded by Mr. J. M. PAGET, it was received and adopted.

REPORT OF DAIRY HERD COMPETITION, 1908.

The following report was read by the Secretary:

Your directors decided to again promote a Dairy Herd Competition, donating $100.00 in cash prizes for patrons of cheese factories and creameries in Western Ontario. Ryrie Bros again very kindly donated a Silver and Bronze Medal. The prizes offered and the rules of competition were as follows:—

Two Diamond Hall Medals, (enclosed in handsome cases), donated by Ryrie Bros., Toronto.

$100.00 in cash prizes, donated by the Dairymen's Association of Western Ontario to patrons of cheese factories and creameries.

A Silver Medal and $15.00 in cash, to the patron who furnishes the largest amount of milk per cow to any cheese factory in Western Ontario from May 1st to October 31st, 1908.

$15.00 in cash, to the patron who furnishes the second largest amount of milk per cow to any cheese factory in Western Ontario from May 1st to October 31st, 1908.

$10.00 in cash, to the patron who furnishes the third largest amount of milk per cow to any cheese factory in Western Ontario from May 1st to October 31st, 1908.

$6.00 in cash, to the patron who furnishes the fourth largest amount of milk per cow to any cheese factory in Western Ontario from May 1st to October 31st, 1908.

$4.00 in cash, to the patron who furnishes the fifth largest amount of milk per cow to any cheese factory in Western Ontario from May 1st to October 31st, 1908.

A Bronze Medal and $15.00 in cash, to the patron who furnishes the largest amount of butter-fat per cow to any creamery in Western Ontario from May 1st to October 31st, 1908.

$15.00 in cash, to the patron who furnishes the second largest amount of butter-fat per cow to any creamery in Western Ontario from May 1st to October 31st, 1908.

$10.00 in cash, to the patron who furnishes the third largest amount of butter-fat per cow to any creamery in Western Ontario from May 1st to October 31st, 1908.

$6.00 in cash, to the patron who furnishes the fourth largest amount of butter-fat per cow to any creamery in Western Ontario from May 1st to October 31st, 1908.

$4.00 in cash, to the patron who furnishes the fifth largest amount of butter-fat per cow to any creamery in Western Ontario from May 1st to October 31st, 1908.

The above prizes are subject to the rules of competition as shown below.

Rules of Dairy Herd Competition.

1st. No herd of fewer than eight cows will be allowed to compete.

2nd. Figures must be taken from the cheese factory or creamery books, and the number of cows and the total and average amounts of milk or butter-fat must be certified to by the cheese or butter-maker, and the secretary of the cheese factory or creamery.

3rd. The average amount of milk or butter-fat per cow must be calculated on the basis of the total number of cows from which milk or cream is sent to the factory during the season of six months, May 1st to October 31st, 1908.

4. No substitution of one cow for another will be allowed.

Note.

Example 1.—If the patron begins to send milk or cream to the factory on 1st of May from say eight cows and continues to send to the 31st of October from the same herd he is eligible. Larger herds the same.

Example 2.—If the patron begins to send milk or cream to the factory on 1st of May with say only seven cows in milk, and in June, or at any other time, another cow freshens, and in July, or at any other time, another cow freshens, making in all nine cows, the patron is not barred from competing, provided the total number of cows (9), is used for dividing the total milk or butter-fat to find the average amount of milk or butter-fat per cow for season. Larger herds the same.

Example 3.—If the patron begins to send milk or cream to the factory on May 1st, with say eight cows, and in June, or any other time in the season, for some cause, one cow drops out of the herd, the patron is not barred from competing, provided the total number of cows (8) is used for dividing the total milk or butter-fat to find average amount of milk or butter-fat per cow for season. Larger herds the same.

Example 4.—If the patron begins to send milk or cream to the factory on May 1st, with say eight cows in the herd, and some time during the season, for some cause, one or more cows drop out of the herd, the patron will not be allowed to substitute a new milch or any other cow in order to keep up the milk from the herd. Larger herds the same.

A Director of the Association or one of the Instructors visited the farm of the winning competitors, examined the books of the Secretary of the respective factories, and satisfied themselves so far as possible that each competitor had complied with the rules and regulations.

The prizes were awarded as follows:—

CLASS 1, SEC. 1.—CHEESE FACTORY PATRONS.

1st. Jno. W. Cornish, Sprucedale Farm, Harrietsville, 8 Holstein grade cows, 57,949 total pounds of milk, 7,234 pounds of milk per cow, $548.02 total money, $68.50 money per cow.

2nd. Seymour Cuthbert, Aberdeen Farm, Sweaburg, 14 Holstein cows, 100,808 total pounds of milk, 7,200 pounds of milk per cow, $946.19 total money, $67.58 money per cow.

3rd. W. E. Thomson, Leslie Farm, Woodstock, 11 Holstein and Holstein grades, 77,066 total pounds of milk, 7,006 pounds of milk per cow, $653.92 total money, $59.44 money per cow.

4th. Geo. W. Pearce, Hillside View, Tillsonburg, 14 grade Holstein, 1 grade Durham, 15 cows, 96,021 total pounds of milk, 6,401 pounds of milk per cow, $926.52 total money, $61.76 money per cow.

5th. Mason Bros., The Maples, Tyrell, 20 Holstein and Holstein grades, 125,322 total pounds of milk, 6,266 pounds of milk per cow, $1,057.50 total money, $52.87 money per cow.

F. W. Woodley, Fairview Farm, Boston, 5 pure Holstein, 3 grade Holstein, 8 cows, 48,725 total pounds of milk, 6,090 pounds of milk per cow, $440.83 total money, $55.10 money per cow

J. W. Earley, Pleasant View, Kerwood, 11 grade cows, 52,690 total pounds of milk, 4,790 pounds of milk per cow, $491.80 total money, $44.70 money per cow.

Alfred Thomas, The Maples, Golspie, 14 grade Durham, 55,673 total pounds of milk, 3,976 pounds of milk per cow, $586.45 total money, $41.89 money per cow.

CLASS 1, SEC. 2.—CREAMERY PATRONS.

1st. R. M. Bowie, Maple Lane, Beachville, 11 common grade cows, 2,195.5 total pounds of fat, 199.6 pounds of fat per cow, $640.27 total money, $58.21 money per cow.

2nd. Frank Wright, Kerwood, 14 grade Durham, 1,779 total pounds of fat, 127 pounds of fat per cow, $429.81 total money, $30.70 money per cow.

W. E. THOMPSON, one of the winners, being called upon by the President for an address said: I am sure I am pleased to be with you this afternoon. You will remember that for the last two years I have been a competitor in this Dairy Herd Competition, and last year I was fortunate enough to get a medal. As far as I was concerned I made up my mind that this year I would not try for it. I did not feel that my herd was in shape to start out another season and try to win a prize in this competition. I had a little bad luck with one of my cows, which I could not avoid. However, I saw Mr. Herns in Toronto, and later on at the Dairy District meeting in Woodstock, and he urged upon me to try again, and finally I decided to enter this year. Therefore you can see that I made no preparation whatever, and took no special care of my stock. Last year some thought that I had fed more grain or expensive feeds than I got returns for, and this year I thought I would just feed my cows in the shape that I thought would be profitable. Last year I fed considerable more grain that I did this year. This year I fed nothing until about the fore part of July, when I started to feed 1 pound of bran and 2 pounds of meal twice daily until the first of November, amounting in all to about $75 in round figures. That is not a great amount of money to spend for mill feed. I was

a little short of pasture, and was handicapped in not having a silo. I have not made a practice of growing lucerne or peas and oats or any crop of that kind. I am only a common man, starting honestly in business, and it takes time to get these things. I am putting up a silo, and expect to have it for next year. I think lucerne or silage are necessary things to produce milk for cheesemaking. I did not know I was going to be called on, and not being a public speaker, cannot speak off-hand, but if there are any questions you would like to ask, I will try and answer them as best I can.

Q.—What breed of cows do you keep? A.—Holstein.

Q.—Holstein grades? A.—About half of them are pure-breds, the balance of them grades.

Q.—The only supplemental food you fed was grain? A.—The bran and the meal and the balance was pasture.

Q.—What amount of meal do you feed? A. Mostly oats. I did feed a little bit of chop and a little bit of oil cake at one time when the oats got short.

Q.—Do you weigh each individual cow's milk? A.—Yes.

Q.—What did that amount to per day? A.—I could hardly tell you off hand.

Q.—What did the best cow give? A.—Do you want figures for the season or the milking season of 10 or 11 months? The first cow was 9,538 pounds. There are some of them that are milking yet.

Q.—Up to what period? A.—End of December.

Mr. Thompson: Here are some of the facts relating to my herd, in detail:

Cow No.	1	freshened	26th March,	9,538 lbs.		
"	2	"	25th "	12,484	testing	4%
"	3 (2 year old heifer)	"	15th January,	10,726	"	3.8
"	4 (11 year old)	"	15th February,	11,952	"	4%
"	5 I had one idle cow.					
"	6 (3 years old)	"	January 1st	12,930	"	3.6
"	7 (5 years old)	"	February 15th	11,192	"	3.3
"	8 (5 years old)	"	March 25th	10,828	"	3.3
"	9 (7 years old)	"	June 16th	7,526	"	3.8
"	10 (2 years old)	"	March 15th	9,278	"	3.1
"	11 (4 years old)	"	March 1st	13,490	"	3.7
"	12 (7 years old)	"	March 22nd	10,530	"	3.4

Q.—Is that the average test for the milking period? A.—Yes, the average test.

Q.—Would you mind telling us how you got the Holstein test so high? A.—I do not know why it is that they vary so, it must be in the individual cow. I have been connected with a Cow Testing Association two years, and every year I have heifers coming on and the cows that make a poor test are discarded and the better ones are kept.

Q.—Then you are pursuing the method of selecting with the object of increasing the better ones? A.— Yes, having regard to the amount of milk they give as well as the test.

Q.—Do you think you can do that if you do not test the individual cows?

A.—No, I do not see any other way of getting at it.

Q.—Which give you the best returns, the pure-breds or the grade cows?

A.—I had a three year old pure-bred heifer that gave something over 12,000, very nearly 13,000, testing 3.6; I think if that was figured out in fat it would be a large percentage.

Q.—She milked longer than the others?

A.—Yes.

Q.—How did she average with the others?

A.—Much about the same.

Q.—How did you feed these cows before they went to grass?

A.—After they freshened they were fed roots twice a day, hay in the morning, and I cut corn after I had it at noon, and straw at night, and meal twice a day.

Q.—How much meal?

A.—About a gallon of meal. The greater part of that would be oats or bran mixed with heavier grain.

Q.—Did you feed any green corn?

A.—Yes, as soon as the corn was fit to cut they were fed liberally until they were tied in the stables.

Q.—What is the value of that two year old heifer?

A.—I have her placed at a value of $250, and she is not for sale at that. I find that the pure-breds are very nearly one-third better than the grades, judging from the heifers that are coming in from time to time.

Q.—Do you use a fly repellent when they are on pasture?

A.—Yes, we use Dr. Williams' spray. You can buy an ordinary hand spray pump for about 40 or 50 cents which will do you for two or three years, and this year all I used for spraying was a gallon of Dr. Williams' spray divided into two halves and added another gallon of coal-oil. I thus made it more cheaply, and it was just as efficient. I think there is one of the secrets of getting milk.

Q.—How frequently do you spray the cows?

A.—Every night. I made a practice of tying them in; spraying them before the pails were brought to the stable to milk. Somebody might object to this on account of the flavor in the milk, but if you close the stables and spray your cows and then open the doors, the spray odor passes out, and I have never found any trouble. The reason I spray before milking is that I think the great part of the value of spraying is in the comfort of milking, to say nothing of the protection which comes to the cows.

Q.—What variety of corn do you use?

A.—Compton's Early and Longfellow. I try to get my corn in so that I can start to feed pretty early. I like to have it cobbed pretty well as soon as I can get it.

Q.—How much profit do you calculate to clear on each cow after your feed is paid for?

A.—Take it for the whole year, it would be pretty difficult to get at, because I made no estimate of the whole year's feed; but there certainly is a profit.

Q.—Are you feeding your herd for butter-fat or for milk?

A.—Both.

Q.—You have no specialty?

A.—No. I might say that I am striving to get a little more butter-fat, if possible. At our factory my returns were low in proportion to the milk sent in; that is because our factory is paying by the butter-fat test, and there is a lot of Jersey milk sent in there, and it makes the average high so that with the Holstein I come below the average, and that reduces the amount of my money. If the milk was sent in on the pooling system my returns would be considerably more, although I cannot say that I am afraid of the testing system.

Q.—What date of maturity was the corn when you started to feed it?

A.—Just as soon as it was about 4 feet high. I always have plenty of it, and I cut it about the 15th of September, when we get it for the corn binder. I can always tell by the milk pail whether there is something in the corn for the cows or not. (Applause.)

Mr. Mason, another of the herd contestants, was called upon to speak, and after referring to his youthfulness, said: In the first place we have quite a large herd, and we have been in this competition for three years, and they had to extend the prize list to give us a show. They gave five prizes, and we happened to get the fifth one. Still, we are quite pleased at that, because it means quite an effort to get a herd in sufficient condition to win a prize at all. My brother and I work together; he is older than I am, and I would have preferred that he should have been here to have spoken for us. He is a married man, and has lost a little of his hair, and you would expect him to be wiser. (Laughter.)

Our father should have the credit of having the good herd, but he is not with us now; and we have taken the same herd and followed on with them, and every year they have improved somewhat. They are all Holstein and Holstein grades, and by careful selection from year to year we have improved them, and I believe they can be improved yet to a great extent.

At the present time we are trying to work in the pure-breds. We have some, and they have proven very satisfactory. They have a far larger capacity than the grades; they are a larger and a stronger cow.

We have always grown everything on our farm that we feed the cows except a little bran, and nearly every year we have sold some grain. Everything that the cows have made for us has been clear profit, but to figure out how much the clear profit has been from year to year is a pretty hard thing to do, because the prices vary from one year to another. I always think that when we produce everything on our farm the most important point is the price we get for it when we sell it.

Q.—What is the principal summer food?

A.—As summer food in the first part of the season we feed a little mixed grain, oats, and barley chop. This year we fed a little all summer. We hadn't anything in the way of green food until the corn was large enough to cut, and then we commenced feeding green corn. As Mr. Paget said last year at the Farmers' Institute meeting that he believed it would be far cheaper to have a silo and feed silage, but we have never had one until this year, and that is something we are going to do. We are going to feed corn early in the season. Mr. Clement, of St. George, was at our farm this summer when we first commenced feeding, and he rather wondered whether there was anything in it or not; but I think he was convinced that it helped to hold our cows at a steady rate. From the time we started feeding them I do not think they varied from 5 to 10 pounds a day for the whole herd, and I am sure we could not have done that last fall when it was so very dry and the pasture didn't grow after the middle of August.

Q.—What is your method of selecting your cows?

A.—In the first place we raise calves from our best cows and keep pure-bred sires of the best stock we can get, and the last few years we haven't had a heifer that has not been first-class. Our cows are all good stock now, and we have had no trouble for several years.

Q.—Do you weigh the milk?

A.—Yes, we have been in the Cow Testing Association for two years.

Q.—That is where you ascertain the good cows?

A.—Yes; and that, I think, creates a surprise at the end of the season, because when we are totalled up at the end of the season, some of the cows that didn't give nearly so much in June and July gave a steady flow in the fall, and they made us more money than the others, because it is during September, October, and November that the milk is always worth the most money.

The following letter was received from Mr. John W. Cornish, Huntsville, winner of the first prize in the herd contest:

Dear Sir,—Yours to hand informing me that I had won first prize in the Dairy Herd Competition. I wish to thank the president and directors for the very satisfactory way in which they have handled the competition this year.

As it is impossible for me to attend the Convention this year, on account of sickness in my family, I will briefly outline how I handled my herd during the past season. My herd consists of eight grade Holsteins, one of which is a three year old heifer. Three of my cows freshened in March, the other five during April and the first week in May.

About three weeks before freshening I gave a ration consisting of ensilage, straw, or clover hay, and about a pint of oat chop, with a little oil cake added. Of course the grain ration varied according to the condition of the cow.

After freshening I increased the grain ration to three or four quarts per cow, at the morning and night feedings, and continued the ensilage and clover hay until they were turned out on grass, from which time I reduced the grain to one or two quarts per cow and changed to bran or shorts in place of oat chop.

I had half an acre of Hungarian grass convenient to the stable for green feed during the dry spell in the summer. I began feeding it as soon as it began to head out, and always fed in the stable morning and evening. This feed lasted until my corn crop was available. We then fed corn mornings and roots at night.

Another point that is very important is to salt and water your cows often and regularly. I salt mine three times a week, and always water during the warm weather three times a day. We always milk at the same hour night and morning, and have the same person milk the same cow.

I always send the laziest man on the farm after the cows. I generally go myself. I never allow the dog to accompany me, as I believe better results will be secured by slow driving of my cattle before milking. The more kindness you bestow upon your herd along with proper feeding, the better will your herd results be.

THE WORK OF THE COW TESTING ASSOCIATIONS.

By Chas. F. Whitley, Dairy Commissioners Branch, Ottawa.

It should be almost unnecessary to explain what a Cow Testing Association is. The work has been in existence in Canada for two or three years, and you have had two shining examples of membership in the two gentlemen who have just spoken. These two members in this Western part of the Province have captured two prizes in the Dairy Herd Competition. Notwithstanding all that has been said on the subject there are still very many men who need to learn about cow testing association work. May I say that membership is very easy. There are no entrance fees and no lodge dues. You have simply to signify your intention to weigh the milk three days during the month right through the milking season. This is not great labor, in fact it is a pleasure, and it is necessary to do it in these days of competition.

1. What is a cow testing association? As these associations have been in existence in Canada for three or four years a description of the methods employed would seem almost unnecessary. But as many men have still need to learn of them, the system may be described briefly. Members are admitted on agreeing to take weights and samples of milk of each cow in the herd at least every 10th day. The necessary time means only a bare ten minutes per cow per month. This should not be considered as any extra labor, but as much a part of the ordinary farm operations as spraying potatoes or grooming horses. The Dairy Division, Ottawa, bears the cost of testing.

2. The work is necessary because individual cows of the same breed, or in the same herd vary so greatly in total yield. Without testing it is impossible to judge what milk tests; there are hundreds of cows supposed to

give milk containing a normal percentage of fat, but which in reality tests very low—2.5, 2.2, or lower. Yields very tremendously; five individual cows in the same district in July gave yields of 540, 630, 720, 840 and 970 lb. milk. Individual cows in the same herd on the same feed vary from 2,800 to 5,600 lb. milk in the season.

COMPARISON OF 2 COWS, SAME HERD. TOTAL YIELD, 7 MONTHS.

The Most Profitable.—Weight of milk, 5.595 lb.; weight of fat, 186 lb.; yield of cheese, 509 lb.; value of milk, $55.95; cost of feed (7 months at $3), $21.00; profit, $34.95.

The Least Profitable.—Weight of milk, 2,790 lb.; weight of fat, 110 lb.; yield of cheese, 272 lb.; value of milk, $27.90; cost of feed (7 months at $3), $21.00; profit, $6.90.

This is but one instance of hundreds of such differences. Two mature animals in the same herd, both freshening in spring, give startingly different total yields, which would remain undetected unless weights are noted down. The best yield is double the poorest, therefore, many would say, the one cow is worth twice as much as the other. But as they each consume about the same value of feed the *net profit* should be considered. It will then be seen that the better cow gives *five* times as much profit, and should be rated accordingly.

3. The work was introduced here because of the remarkable revelations of records in other dairy sections of the world. Thanks to the press, the best dairy thought cannot be confined within the boundaries of any one country; it is international. When it is stated that in such sections are to be found hundreds of herds producing from 7,000 to 10,000 lbs. milk, it surely should be an incentive to dairymen here to have more records worth showing. We are scarcely yet awake to what similar records may lead.

4. What has been already accomplished in Canada has amply justified its introduction; and further, has abundantly proved the necessity of its continuance and rapid extension.

Many men can point with satisfaction to an increase of 25 per cent., 35 per cent. and 50 per cent. in the milk yield per cow. Some men have doubled the yield. One man for instance has raised his average production in two years from 4,500 to 6,100 lbs. milk, per cow, while the factory average remained at 3,400 lbs. Hundreds of farmers are now taking up the work in earnest, finding it, as they state, of immeasurable benefit.

Systematic improvement of the dairy herd cannot be made until records form the starting point. We cannot create an improved herd, we must select and develop. All the skill of the world's wise men cannot construct one cell of the millions of which the body is composed; nor weave one square inch of the delicate fabric in which the Creator has wrapped us. The best we can do is to assist—to work in harmony with—to improve—to develop. Records of production are the only sure and certain guide in selection and improvement. First must come the root of the whole matter, a personal conviction of the system's value; the branches and fruitage of higher attainment will surely follow and add a new charm to life.

A logical outcome of this record work is the formation of co-operative breeding associations, such as exist in a few localities in Quebec and some of the United States. The purpose of such associations is to procure and use pedigreed sires for improving live stock through a system of up grading. This method implies the continued use of some one kind of pure blood on the grade and mixed bred stocks. These associations oppose the admixture of the blood of several breeds, and the use of cross-bred grade and scrub sires.

5. The work is spreading and is likely to grow.

Members this year have sent in records for as many as 6,600 cows a month as compared with 2,800 cows in 1906. It appeals to the shrewd common business sense of the practical dairyman. We cannot remain content with poor records; we must progress or be out of the running: consistency is the badge of stagnation.

Record work has shown Canadian dairymen that they may reach a definite work in dairy breeding and dairy feeding. New purposes are being given, and means whereby it is possible to know when they are accomplished.

Wise men may say that there is nothing new. However, we are not living altogether in the past. The stream of time has worn a deep chasm between pioneer days and the era in which we now live. The farmer's life may be constituted of the same work-units as it was fifty years ago, but if he is performing the same tasks as his grandfathers, he is most certainly doing them in a different way, doing more in less time, and best of all, working and planning with more perfect aim, with standards to be raised and with tangible objects ahead at the goal for which he strives. Dairy records aid in clean cut work and in eliminating poor material.

6. The work assists the solution of domestic problems of farm life; it appeals to the boys and girls, riveting their interest in home economics. It induces the hired men to milk cleaner, so that from that source alone an extra 500 lb. milk per cow may be obtained. The best kept and the neatest records are evidently those sent in by some of the gentler sex, and where the women get interested, we may always count on steady improvement.

A knowledge and interest concerning the business affairs of the homestead must act as an influence towards a higher and more genuine respect on the part of the young men and women of the country for the business of farming. The home nest will be forsaken less and less by the young fledglings when it holds forth to its young people a partnership in the daily doings.

7. The work calls forth the best efforts of intelligent humanity in providing better care and attention for the most patient and hardest working species of farm stock. When the effect of cold, neglect and exposure is reflected in the records, the necessity of better treatment is forced on the owner's attention. The unfailing law of retribution, "Whatsoever a man sows that shall he also reap," applies to the housing and feeding of dairy cows. Liberality is repaid, kindness is not lost.

When the shrinkage in milk yield from one month to another attains the startling figures of 30, 40 and even 50 per cent. in some cases, while with other herds it is down to 20, 18 and 13 per cent., it makes one consider a change of methods, and such wise provsion as will secure a persistent flow.

COMPARISON OF AVERAGE AND TOTAL YIELDS FOR SIX MONTHS, MAY TO OCTOBER.

Association.	No. of Cows.	Average.		Total Yield.	
		Milk.	Fat.	Milk.	Fat.
		lb.	lb.	lb.	lb.
Rockford	37	6,093	200	225,454	7,408
Central Smith	37	5,568	185	209,034	6,843
Warsaw	37	4,392	144	162,506	5,355

Association.	Best cow.		Poorest cow.		
	Milk.	Fat.	Milk.	Fat.	Age.
	lb.	lb.	lb.	lb.	
ockford	7,598	237	4,090	145	4
entral Smith	9,242	317	3,670	134	10
Varsaw	5,430	165	3,270	104	8

The figures herewith indicate the astounding differences revealed on omparing total yields of groups of cows for the factory season. While 37 ows in the Warsaw Association gave 162,506 lb. milk, the same number of ows in the Rockford Association gave sixty-three thousand pounds more or early 3 tons of cheese extra during the same six months. It certainly pays o induce persistent flow and avoid excessive shrinkage. Further, it pays rell to select good individual cows. The 8 year old cow noted above gave nly 3,270 lbs. milk, but the one in the Central Smith Association gave 9,242 bs. during the same period. Excellent records are absolutely lost sight of hen only averages are considered.

8. The work is undertaken with one dominant purpose constantly in iew, a *study of individual cows with a view of increasing economical pro- uction.* While the selling price of cheese in Liverpool, be it 45/ or 5/, is beyond the patron's control, the cost of production of milk is umediately under his eye, and can be reduced by learning what records ave to teach. The selected herd can produce milk at one third the cost of any an average herd. Why not save the difference?

The promising individual must remain undiscovered unless a record kept. Unknown to their owners, most valuable cows have been sold for a ng, or even given away. A prominent magazine recently gave a photo of cow purchased at ordinary market price from a city milkman who could not id time to test milk, or keep a milk record, and consequently never dis- vered her wonderful capabilities. She has a record of close on 1,000 lbs. itter; a veritable jewel of a cow, at last recognized and appraised accord- gly. Another cow also unknown, unstudied by her owner, was literally ven away as "just an ordinary cow." She gave over 13,000 lbs. milk st year. Who can estimate how many similar treasures have remained st. Cold, arithmetical "averages" never detect such beauties; they level wn and pry up, completely submerging the deserving individual.

Cows must "make good" nowadays or make tracks; each one must be ecked up and pay up like each passenger on a train at the hand of a watch- l conductor. Why should unenlightening "averages" warp the judgment stifle enquiry as to necessary individual performance? Is it any satis- ction to a needy widow or an orphaned boy to know that the people of nada carry $700,000,000 of life insurance? That "averages" very little r head of population; while many men are uninsured, others carry $50,- 0 or more. Similarly, average yields give no due credit to the star per- mers, while wretchedly poor cows are raised to undeserved rank.

Records disclose great variations in quantity and quality, but generally very small difference between cost of keep and care of a cow with low ld, and a cow with high yield. Hence, in the selection of right animals the true application of economy. The keeping of records lies at the foun- tion of systematic development of economy. The right animal, the ected cow, is the economical producer. If six cows will do as much as, and even better than nine unselected, why not economize and have the prime

satisfaction in handling the better stock? In some districts it takes 200 cows to accomplish as much as 75 in other districts. The weeding out of cows with low yields is at the base of economic production. We have found in a herd of 14 cows that three made as much profit as the remaining eleven.

9. The work recommends itself to every real dairy farmer as distinguished from the man who simply keeps "just cows."

When thousands of cows in Ontario are shown to produce only 2,500 lbs. milk apiece during the cheese f ctory season, it indicates need of better methods. Other Ontario farmers in the same localities obtain 4,000 lbs. and over during the same period. Dairying to-day is real business, and not the simple farming of old days when it was just a case of selling wheat. It was then an easy matter to calculate, so many acres, so much grain, so much cash. To-day we have diversified farming, a more complicated business, crops are sold in new form, as milk or butter; the manufactured article is produced. The gross returns may be satisfactory, but profit can be largely increased if the scales and Babcock are applied to the performance of each individual cow. There is no more reason that any cow should make her living out of her owner for nothing than that a hired man should be paid wages to loaf round and do nothing. One of the most esstential points in business is to ascertain definitely where profit is made, and to stop losses.

CONTRASTS BETWEEN COWS IN 3 HERDS IN SAME ASSOCIATION, 10 MONTHS, 1908.

Herd	Poorest Yield		Best Yield	
	Milk	Fat	Milk	Fat
	lb.	lb.	lb.	lb.
A	3,610	134.1	6,590	212.8
B	5,068	243.5	9,420	316.3
C	4,618	200.6	12,960	412.1
Value of Milk	$46 12		$129 60	
Feed	40 00		50 00*	
Profit	$ 6 18		$ 79 00	

NOTE.—Profit is 13 times greater with this cow.

These figures emphasize individuality, the important point to be considered in connection with the modern business herd. When it is seen that in a first class dairy section there are such extraordinary differences between cows in the same herds it is another evidence of the need of selection. While one man is retaining a 3,600 lb. milk cow and feeding her at a cost just about what her milk brings, the two other men have as their poorest, cows that gave over 1,000 lbs. milk more. And in the best yields the strides are greater still, from 6,000 up to 9,000 odd, then up to the discovery of another jewel giving close on to 13,000 pounds. Note again the difference in profit, with the 3,610 lb. cow it is practically nothing, but in herd C, even allowing $10 extra feed for the large producer, the good cow makes 13 times as much profit as the poor one.

Dairy farmers, does each one of your cows pay a profit? Do you know that she does? The way is easy, expense small, returns great. This is not book farming or theory, it's business.

Then, apart altogether from the question of profit there is a consideration which to the genuine farmer should appeal hardly less, namely interest. The work is one which makes the farmer an investigator, bringing him into closer touch with the scientific problems that underlie the practice of farming. It is in this direction that farm life has one of its immense advantages over industrial life, in the broad, living, scientific interests with which it is and should be in touch. And the cultivation of these interests makes and helps the practical farmer. The men who are following out the milk record system are not the failures in dairy farming. On the contrary, they are among the best and most successful.

10. *The work is of widespread, vital interest, not merely of local importance, and must embed itself in the thought of every true dairyman.*

More milk per cow proportionately lowers factory expenses.

Not only patrons, cheese makers, instructors and factory owners are dependent on the cow's production, but all merchants and bankers, etc., wish to see development. There is an interweaving of interests not lightly to be considered. Every Canadian is a consumer of dairy produce.

The echo of action is everywhere evident. We slip into the ruts of other men's deeds. One progressive man in any locality may start the good movement, wielding an influence not visionary, but practical. It takes but few men at the city power house or in the ocean liner's stokehold to make things move. But these few are necessary. The contagion of good example soon spreads. One man's constructive example transforms an ugly street into one of the brighest vistas of beauty. One good dairy herd is an object lesson and an inspiration for scores of others.

11. *The work has tremendous commercial significance and is of pungent distinctiveness.* The present volume of trade in milk and its products can be enormously increased even with only the present number of cows; while the augmented profits will not be retained by a few middlemen, but distributed to hundreds of farms in every province. While peaceful agricultural operations may not unlock the greatest treasure chests of the world, the distribution of wealth is more even than from gold or diamond mining. But a slight increase in milk production per cow means hundreds of dollars more to every township. It can easily mean an extra $160,000 to the county of Grenville, and an additional five million dollars to the Province or Ontario.

If this work could be forced on the attention of dairy farmers generally, and if they would really take it up seriously, it would not be too much to except that in five years' time from now, at least three-quarters of the cows would each give fifteen dollars' worth more milk,—this means an extra 12½ millions of dollars for Ontario farmers. Get busy!

12. *The work is of national importance.* The eyes of the world are on the 20th century's wonder, this Canada of ours, this marvelously developing Dominion. The reputation of milk producers is at stake. Will they awaken to the necessity of adopting modern business methods in the practice of their calling, and thus strengthen the very foundations of our great national industry, dairying? The influence of their progressive action will permeate each dairy section, transforming unfinished effort into glorious achievement; the scope of their activities may well be termed nation building.

"There is a tide in the affairs of men, which taken at the flood leads on to fortune," as the Bard of Avon sang, and it is for Canadian dairymen to be up and doing. Grapple with the question now, and the Dominion gains in every way immediately. With no illogical and inconclusive dreaming of the great things that might be accomplished, let each man get to work, and he will do more than command success, he will deserve it.

CATTLE FOODS.

By Prof. R. Harcourt, O.A.C., Guelph.

The study of the science of cattle feeding has received a great deal of attention during late years. Fortunately, while a knowledge of the results of the numerous investigations would be of great aid to the thorough understanding of the subject, it is not essential to success; for the practice of some experienced feeders leaves little to be desired. They probably have learned much from their forefathers, and, this together with long experience with the same kind of cattle and feeding stuffs, and the natural instincts of a feeder, has enabled them to become somewhat proficient in the art of feeding. There are, however, many farmers, both old and young, who have not been bequeathed any valuable experience, and, further, there are on the market to-day a great variety of new foods about which very little is known. Consequently there are many reasons why we should look into the question of the composition of some of the cattle foods.

Before taking up the percentage composition of the foods, let us look at the functions of the various constituents which are contained in these materials.

When we study the nature of the food of plants, we find that from such simple substances as carbon dioxide, nitric acid, water, and a few salts, a plant is capable of constructing a great variety of elaborate compounds. It accomplishes these surprising transformations by a consumption of energy (sunlight) external to itself. An animal has no such contsructive power. The animal frame is built up of food compounds which are simply transformed into similar body compounds, or it may be produced by the splitting up or partial combustion of some of the food constituents in the bdy. The animal derives no aid from external energy. The temperature of the animal body (about 100° F.) is maintained by heat generated within the body by combustion of materials eaten as food. The energy required for masticating food, pumping blood through the system, walking, drawing loads, etc., is also derived from the food eaten. The source of the heat and force in the body is the food.

The parts of foods which furnish the substances for body material and for heat and energy are: (1) Protein, (2) fat, (3) carbohydrates, and (4) ash material.

Protein, so far as foods are concerned, is made up of two classes of substances, albuminoids (proteids) and amides. The amides are found in immature plants and are not so valuable as the higher proteids materials. The albuminoids, which occur in grain, roots, and other forms of vegetable foods, are similar in composition to those found in milk, blood, and flesh. They are commonly called the "flesh formers," as they are the only materials in the food which the animal can construct into flesh. They are also the source of such materials as hair, wool, hoof, horn, etc. Further, by the combustion of the albuminoids in the body, heat and mechanical force are developed, and, under some circumstances they are split up with the formation of fat.

The fats found in food are similar in composition to such substances as lard, tallow, etc., which are the common fats formed in the animal body. The fat may be either burnt in the animal system to furnish heat and energy or deposited on the body as fat. As a heat and force producer, fat has a greater value than any other ingredient of the food.

The carbohydrates of the food are chiefly starch, sugars, and celluloses, and form the largest part of vegetable foods. The latter substances form the stiff framework of the stems of plants and the hulls of seeds, and are only partially digested. These carbohydrate bodies are not permantently stored in the animal body, but serve, when burnt in the system, *for the production of heat and mechanical work*. They are also capable, when consumed in excess of immediate requirements, of conversion into fat.

The ash materials present in the food are the same as those found in the animal body; all that is accomplished by the animal is to select from the digested ash constituents those of which it is in want.

From what has been said, it will be seen that the albuminoids are the only constituents of the food which are capable of being transformed into flesh. They will also produce heat and mechanical work, but fat and carbohydrates, especially the latter, are the cheapest materials for this purpose. To make the most economical use of foods, the albuminoids should be fed in such quantities that they will do the work which they alone can do, and allow the heat of the body and the energy for work to be obtained from the cheaper fat and carboyhydrates. These are the facts which form the basis of the balanced rations and feeding standards; for a balanced ration is simply a statement of the weight of protein needed by the animal of a certain weight to do the work required of it in growing, fattening, or in the production of milk, etc., together with the weight of fat and carbohydrates required to keep up the temperature of the body and do what mechanical work is necessary and leave a residue for the formation of fat, if such is desired. Naturally a young, growing animal will require more protein in its food than one full grown; for it is building up bone and muscles,—both of which require protein. Thus milk, which is the natural food of the young animal, is rich in protein. Again, a cow giving milk requires an abundance of protein, because the feed is the source of the protein of the milk. It is true that a horse, for instance, may do a greater amount of work than the food fed will furnish energy for, or that a cow will give *a larger amount of milk than the food will warrant, but this is done at the* expense of the reserve of materials stored in the body, and as a result the horse or the cow becomes thinner.

Another point worthy of mention here is that there is always a certain amount of food required to maintain an animal in a condition that it will neither gain nor lose, for energy must be expended in masticating and digesting the food, circulating the blood through the body, etc. If the animal is of a restless, nervous disposition, it will require more food than if it is of a quiet, even disposition. Food must be provided for all these factors before any of it will go to the production of fat or milk, and it is the amount of food that the animal receives over the quantity required for supplying energy for these factors, or over the maintenance diet, as it is spoken of, which affects the gain in body weight or the yield of milk. Consequently, it is *evident that there can be no profit in feeding* a maintenance diet to a cow giving milk. On the contrary, the aim should be to get the cow to eat a maximum amount of food in order that there may be a large surplus for production. In this way a much smaller proportion of the food goes for maintenance and a larger proportion to production purposes, with a corresponding increase in the profits. **Naturally it must follow that the animal which will eat the largest amount of food, and which at the same time is of such a disposition as to require a small amount for maintenance purposes, is the most profitable one.**

Composition of Foods.

In the preceding paragraphs we have named the chief constituents of foods and described some of their functions in the animal body. We shall now consider the composition and feeding value of some of the foods, or rather groups of foods in common use.

The feeding value of a food is largely determined by two factors: (1) its composition, (2) its digestibility. The first of these deals with richness of the food in protein, fat, carbohydrates, and ash materials. The second determines the extent to which these various constituents become available in the body. A knowledge of the composition of a food is important if it is to be used intelligently. In the light of previous statements, we naturally consider those foods which contain the largest amounts of the protein and fat and the smaller percentage of crude fibre as the most valuable. The following table gives the percentage amount of the various food constituents present in a number of the most common foods:—

Composition of Cattle Foods.

—	Water.	Crude Protein.	Fat.	Soluble carbohydrates.	Crude Fibre.	Ash.
	%	%	%	%	%	%
Wheat	10.5	11.9	2.1	71.9	1.8	1.5
Oats	11.0	11.8	5.0	59.7	9.5	3.0
Barley	10.9	12.4	1.8	69.9	2.7	1.8
Corn	*10.6*	*10.3*	*5.0*	*70.4*	*2.2*	*1.5*
Peas	14.0	22.5	1.6	53.7	5.4	2.8
Timothy hay	13.2	5.9	2 5	45.0	29.0	4.4
Clover hay	15.3	12.3	3.3	38.1	24.8	6.2
Alfalfa hay	8.4	14.3	2.2	42.7	25.0	7.4
Oat straw	9.2	4.0	2.3	42.4	57.0	5.1
Corn silage	79.1	1.7	0.8	11.1	6.0	1.4
Mangels	90.9	1.4	0.2	5.5	0.9	1.1
Turnips	90.5	1.1	0.2	6.2	1.2	0.8
Wheat middlings	10.1	15.5	3.9	62.5	4.3	3.7
Wheat bran	10.4	15.0	3.8	57.0	8.7	5.1
Cotton seed meal	5.9	44.2	13.6	24.6	4.8	6.9
Linseed meal	9.1	30.4	7.1	36.9	10.6	5.9
Gluten meal	7.1	38.8	3.4	47.6	2.0	1.1
Gluten feed	8.6	25.0	4.6	54.8	5.9	1.1
Brewers' grains	6.6	14.6	6.6	58.1	12.8	1.3
Oat hulls	8.1	2.2	0.9	53.9	28.1	6.8
Dried beet pulp	2.9	8.5	1.1	65.9	15.2	6.4

The valuable forage plants of this country belong mostly to two families, the grasses and the legumes. June grass, red top, timothy, and the cereal grain plants are types of the former; and the clovers, alfalfa, and peas of the latter. The most essential difference between the members of the two families of plants when considered as feeding stuffs is in the larger proportion of the protein in the legumes. For this reason they are very justly regarded as the better foods for growing stock and for general use on dairy farms.

With reference to the composition of all dried fodders and roots, foods that are fed in an immature state, it may be stated that they are liable to considerable variation. We find that the composition depends largely on the stage of maturity at which they are cut and also upon the character of the maturing. In general it may be said that as a plant matures the proportion of water, protein, and ash matter decreases, while the proportion of carbohydrates, especially of fibrous material, increases. As this latter substance is largely indigestible, fodder crops deteriorate towards maturity. Young grass is much richer in albuminoids and contains a smaller proportion of indigestible fibre than older grass, and is, consequently, more nourishing. The same comparison may be made between young clover and that which is allowed to mature for hay. It follows that fodder crops should be cut for hay before they reach maturity, and experimental work and general experience has fully demonstrated that these crops should be cut immediately full bloom is reached. Alfalfa is an exception to this, because it very rapidly becomes fibrous and should be cut in the early blossoming stage to obtain the best results.

Regarding the root crops, it has been found that while fodder crops deteriorate towards maturity, because of the conversion of soluble forms of carbohydrates into the insoluble and indigestible fibre, root crops, such as mangels and potatoes improve, owing to the carbohydrates produced in this case being sugar and starch, both of which are of great feeding value.

The root crops do not contain a very large amount of the valuable food constituents, but when fed along with the dried fodders they probably have a food value much greater than their composition indicates. This is due to the increased succulency which they impart to the ration.

The place of grain in a ration is to increase the proportion of protein and other digestible materials, or in other words, to make the ration more concentrated. It is generally agreed that cows of 1,000 pounds weight need approximately 16 pounds of total nutrients daily. Animals that are thin in flesh, especially when fresh in milk, can consume two or three pounds more to advantage. Of these 16 pounds, approximately 2.5 pounds of protein is necessary in order to enable the cow to produce large and continuous yields of milk. If a cow is fed all hay, she cannot eat enough of the food to obtain the amount of the nutrients mentioned. Thus, suppose a cow should be fed all she can consume of any palatable, dry, coarse fodder, such as good hay, she would have at her disposal the following digestible nutrients, approximately: Protein, 1.4 pounds; fat, 0.4 pounds; carbohydrates, 12.4; total, 14.2. It is clear that such a ration lacks in protein, as well as in total digestible matter. In order to overcome these deficiencies, recourse is had to the concentrated feeds, rich in protein, and sufficient is added to increase the protein to the desired amount. This, in brief, is the function of grains and concentrated by-products in the ration. It is, of course, evident that the cereal grains, as corn, oats, wheat, etc., are not sufficiently rich in protein to very materially increase its proportion in the diet. But these foods are rich in nitrogen-free-extract or carbohydrates, that are easily digested and are very useful when fed along with the coarser foods which contain much fibre.

Pea meal, linseed meal, gluten feed, wheat bran, and middlings are foods rich in protein and are, therefore, most valuable components for a ration intended for dairy cows. On the other hand, it is evident that oat hulls, dried beet pulp, corn bran, and such low grade materials cannot build up the protein side of a ration. They are also entirely unfit to be used as substitutes for linseed meal, gluten meal, gluten feed and such nitrogenous materials.

What has been said serves to draw attention to the point, that when purchasing foods the percentage of protein they contain is of prime importance. The home-grown crops, especially the grasses and cereal grains, are more likely to be deficient in this than in any other constituent, but when clover or alfalfa hay are used as the coarse foods, the use of concentrates, especially rich in protein is not so necessary.

The shortage of coarse foods and grains the last few years has been the means of causing many feeders of live stock, particularly dairymen, to consider the advisability of purchasing certain of these mill by-products for which, heretofore, they have had little or no use. Dairymen, too, are recognizing the fact that in order to secure the best results from their cows, they must feed a ration richer in protein than can, as a rule, be compounded from the grains, hay, and straw raised on the farm. The by-products best adapted to enrich the diet in protein are the residues from the manufacture of some specific product from the seed or grain, as, for example, oil from cotton seed and flax seed, starch and sugar from corn, beer from barley, and flour from wheat, rye, and buckwheat. All these by-products which include cotton seed meal, linseed meal, dried brewers' grains, gluten meal, gluten feeds, and the various kinds of bran, middlings, etc., are very much richer in protein than the original seeds or grains, because the substances extracted from them consists of fat, in the case of the first two, and of starch, or products rich in starch, in the case of the others. Thus proportionately increasing the protein in the residues. For this reason, all of these by-products have been found to serve an excellent purpose in the building up of rations; they are generally palatable and healthful and, if judiciously used, do not contribute any undesirable qualities to the products, beef or milk; besides, they possess the further advantage in that, in many cases, the cost of the ration is reduced by their use. Their intelligent purchase and economical use, however, requires that the purchaser shall possess a definite knowledge of their composition, that is, he should know, first, not only how much protein and fat the genuine products, cotton-seed meal, linseed meal, gluten meal, gluten feed, bran, and middlings contain, but also whether there is reasonable uniformity or wide variation in respect of these compounds in the composition of the products of the same kind or name; secondly, whether any of them are liable to be reduced in value by the addition of cheaper substances.

We have endeavored to collect some definite data regarding the character and composition of these by-products. For this purpose, we gathered a large number of samples and analysed them, the results of which were published in Bulletin No. 138. Since this bulletin was published, we have analysed many more samples, and the results show that a large number of the various products offered for sale are of good quality, but that those of the same kind from different manufacturers vary quite widely in composition. Further, we have found that in some cases there is a tendency to mix residues of one grain with another and sell them under a trade name, or to add low grade by-products to those with which the farmer is familiar, as, for example, oat hulls to wheat bran. With these facts before us, it is evident that the purchaser cannot form a correct idea of the composition or value of a feed from the name given it, and that steps should be taken to have these concentrated feeds sold in such a manner that the percentage composition rather than name will be the guide to their value. Laws have been passed in many of the States of the American Union making it compulsory for the seller of these mill by-products to print on the bag the guaranteed maximum percentage of protein and fat and the minimum percentage of crude fibre, and, also, the

grains from which the feed was made. In this way the farmer knows exactly what he is buying, and if he is familiar with the composition of his own feed stuffs and the requirements of the animals he is feeding, he can purchase his supply of concentrates intelligently and with every assurance that he is getting full value for his money. It will pay the farmer in good hard cash to make a thorough study of the whole subject of cattle feeding and to make themselves familiar with the nature of the various feed stuffs now on the market in order that they may not only feed more economically, but that they may intelligently assist in the procuring of laws similar to those now in operation in the United States, which would make it possible for him to purchase feeds with a guarantee as to the amount they contain of the essential food constituents.

Q.—What is the relative value of linseed meal as compared with old process meal? A.— In the old process meal the fat is removed by means of pressure, and in the new process it is extracted by solvents, and there is a more complete extraction of the fat, so that the new process meal will contain the least of this fat, and will be correspondingly lower in value. There is not a great difference in the price.

Q.—Are any of the dairymen using gluten foods or gluten meal? A.—We can use a certain amount of linseed meal, but there is a limit to the amount you can feed. Cotton seed meal is entirely unsafe to feed to calves or young pigs. It may be used in limited quantities to older animals.

Q.—What amount of linseed meal would you feed to a cow in a day? A.—I would not recommend feeding more than two pounds a day to a cow, and I would not start at that amount. I would start at a lower amount.

Q.—Would it be as valuable as alfalfa? A.—If you have a good quality of alfalfa, it is doubtful whether it is best to handle expensive high price materials. I would rather depend on bran and brewers' grain. When you start to feed cotton-seed cake and linseed cake, you are handling something that is too high in price and it can be wasted unless you are looking after the feed yourself.

Q.—What would you recommend to feed with good ensilage and clover hay? A.—There would not be the same need so far as the effect on the system is concerned to feed bran as there would be some of the other drier foods. I know of good results from the use of oats and bran along with clover hay and ensilage.

Q.—How are we to know how much of this linseed meal we are to put in? A.—Having a table showing composition of the feeds to be used, calculate the number of pounds of protein in the ration and the number of pounds of carbohydrates and the fat, multiply the pound of fat by 2¼, add the product to the pounds of soluble carbohydrates, and divide the sum by the pounds of protein. The result should be about 5, indicating a nutritive ratio of 1 to 5. We should not get far beyond 1 to 5. If we do we decrease the digestibility of the food. I know one case particularly on the farm on which I was brought up. One year we were short of grain in the spring, and we had a lot of potatoes left over and they were worth only 25 cents a bushel ,and we thought we could feed them to the cows. We were not feeding very much grain, and we added this starchy material to the diet of those cows, and from that very day they started to eat it they went back in their milk, not because the potatoes were not good, but because we were feeding too much starchy material, and we decreased the digestibility of the whole of that diet. Therefore, you can see you can get these figures so far apart that you will not get good results.

Good results can be obtained from the use of oats and bran along with clover hay, and if you add timothy hav you can not get enough protein in the food and you will have to introduce something else.

Q.—How about whole flax seed ground? A.—That would not be as high in protein as linseed meal; it is a very rich food and would have to be used with a great deal of discretion.

Q.—Would there be more protein in well matured fodder corn than in corn silage? A.—No, if you let corn go past its maturity you decrease the amount you will get out if it, because you decrease the digestibility of the food.

Q.—How does linseed meal and gluten compare in price at the present time? A.—If you could buy gluten meal true to name then you would pay fully as much for it as you would for linseed meal. But how are you going to know whether it is true to name or not? Gluten meal is the gluten of the corn flour separated and kept by itself, therefore it is very high in protein matter. We analyzed 22 samples of what was called gluten meal and the average per cent. of protein was 24.98. We analyzed 17 samples of gluten feed and the average was 25.65, that is nearly 1 per cent. higher in gluten than it was in gluten meal. The variation in the proportion of the gluten meal was from 15 to 34 per cent. The variation in the percentage in the foods which were being sold as gluten meals was 15 to 34 per cent., over double the amount of protein, and both were selling under the same name and presumably for the same money.

Q.—Do you know which factory you were getting it from? A.—We knew at the time; I have not got the figures now.

Q.—What means would the miller have of knowing he was selling a genuine article? A.—He would know by the way he made it.

Q.—I understood you to say that sometimes the miller sold in ignorance? A.—Not in the nature of the materials in it, he might be making it perfectly honestly according to his idea. Take the case where it varied from 15 to 35 per cent. There must have been some difference in the two meals, and yet they were going on the market under the same name.

Q.—Why is corn silage considered such a great milk producer when it is low in protein? A.—In the first place we get what we have got to have in all foods, we have succulency. You might say. "Why do turnips give such good results when they have such a small protein content? We have succulency, and we have that in grass.

Q.—Is there any difference in the water in those things—I have been told that turnip water is not good water? A.—I guess it is. There is no difference normally in the water in the milk and the water that is added to the milk.

Q.—Would gluten meal make butter oily? A.—There might be something in that. We find these foods all have their influence on the consistency of the fats; it is a corn oil, a soft oil, and it might have some effect on the butter.

Q.—What would you consider a balanced ration for a herd of cows in full flow of milk? A.—I think where a man has clover hay in abundance that he might make a very fair diet for his stock out of the use of that clover hay along with bran and oats mixed in equal quantities and feed it at the rate of 8 to 10 pounds a day, according to the size of the animal. If the clover hay is not up to quality he might add a little gluten meal or linseed meal or some of the concentrates. If the hay has timothy in it I would add a pound or so per day of linseed meal. If ensilage is introduced there is not the same need for bran, but it does need something in the way of protein.

Q.—Would it pay a farmer to give $20 a ton for bran if he had plenty of roots? A.—I think it would pay him to buy some bran; even pea meal would come in very well, because if he is using a lot of roots he does not need to use so much bran. I think that for milking cows we should feed some of these concentrated materials to keep up the protein side of the diet.

Q.—Supposing a man has a sample of gluten meal or linseed meal and he has it analyzed, would he be pretty sure to get the same analysis from those meals afterwards in purchasing them in quantities? A.—I presume a sample taken out of the ordinary run would be as they usually make it. We are going to analyse a number of samples that are sent in. We have had about 20 samples sent in since the beginning of the year. We cannot promise that we can send a report by return mail, but we will get it as soon as we can.

Q.—What variety of wheat bran gives the most protein? A.—Spring wheat is richer in protein than fall wheat. I think that for dairymen there is no better roughage crop can be grown than alfalfa; you get a big yield and it is very rich.

Q.—Can it be used in the silos? A.—I do not think it can be cured there to the very best advantage.

Q.—Is there more than one kind of alfalfa? A.—Yes, I believe there are a great many kinds. I cannot recommend which is the best. (Applause.)

ADDRESS OF WELCOME.

The Mayor of Brantford was introduced, and cordially welcomed the Convention to the city. He then proceeded to say: Looking over the records this afternoon, I discovered that yours is a very old industry. You date back, at all events, as far as King Solomon, the wisest man, who said, "That the churning of milk brings forth butter." So that he had in his day at all events discovered that much, and he thought it worth while to give it a place amongst the many other wise things he said. And going back farther than that, we discover what a large and important place the dairy products of the olden time had in society, for we read that Jesse said to David, "Carry these ten loaves to thy brethren and these ten cheese to the captains of the army." (Applause.) Going back even farther, we discover that Abraham entertained the angels with milk and butter.

We see then that your industry is one of the very oldest, and the dairy products in the olden times, ranked amongst the most important as they do to-day, and I congratulate you and the Dairymen's Association of Western Ontario upon the high position you have taken in this regard and upon the very great prosperity which you have attained as an Association. It is a great thing for our industries to find a home alongside of old established industries having a connection all over Canada. It is fitting that this Association representing the most important branch of agriculture should come to a city like Brantford. If we are going to build up this heritage that God has given us on this continent, we must not be jealous of each other, but we must stand knee to knee, hand to hand, and shoulder and shoulder if we are going to make the most of this Canada of ours.

Mr. Cook, President of the Board of Trade, Brantford: It affords me peculiar pleasure on behalf of the Brantford Board of Trade to welcome to our city this very important Convention. The Board of Trade is, as you know, composed of manufacturers and business men. That being the case

we felt very friendly towards this Convention, because you are all manufacturers and you are all business men. We welcome you to this city for many reasons, but especially because of the great business you represent.

When I tell you that the dairy productions of the Dominion of Canada for 1908 amounted to $94,000,000, one can see at once that the dairy business *is of the greatest importance to this country*. As your President told you this afternoon, the export of dairy produce has not been quite up to the mark of former years. I notice that the export of cheese and butter for the last fiscal year comes to about $24,000,000. That is something you should be proud of, although in former years the figures were higher than that; but it must be remembered that the home consumption is increasing, and although the exports are decreasing a little, I am sure the actual manufacture of dairy products is on the increase. I would like to encourage you to go forward. This country in its agricultural capacity is able to supply the whole world, but certainly the British Isles, with pretty near all the dariy product they need That time has not yet arrived but it is coming. We welcome you because of the Association itself; the Dairy Association, by careful investigation has greatly improved the outlook of your condition. When the Scottish Farmers' Commission was here, one gentleman spoke of the discouragements of the dairy condition as they had it in Scotland. Some of these discouragements were the restrictions, the severe law regulating dairying, and he said we simply have to overcome these things by stricter attention to our own business. *We have to adopt methods to increase the flow of milk, to see that our* premises are scrupulously clean, so that we can obtain a greater supply and a better product and then the people are bound to have it. We welcome you all, because of your industry.

I read long ago that people made a golden calf and worshipped it, now I think I see here some of these descendants who are worshipping it here to-day. In the Province of Quebec there are 2,800 cheese and butter factories; in the Province of Ontario, 1,264 and in all other parts of Canada, 250. There are 4,300 factories distributed all over this country. We are destined to be a great country. We have a great clay belt in New Ontario with millions of acres largely adapted to dairying, and well designed to carry on this business in the northern part of this Province.

The crops of the Northwest alone, for 1908 were 232,000,000 bushels. Eight years previous they were only 32,0000,000 and we are going to increase more rapidly in the future than we have in the past; so that you can understand you farmers are engaged in the greatest industry in the world. The agricultural industry is the greatest, the most important, and by far the best industry of the Dominion of Canada, because it is the foundation of all. It is the true industry, because the wealth you create is created out of the soil and that, as you know, is the true wealth; that which comes from the soil, the forest, the mines and the fisheries.

AGRICULTURAL PROGRESS.

By G. C. Creelman, President, O.A.C., Guelph.

It is always a pleasure for the officers of the Ontario Agricultural College to attend meetings of the Ontario Dairymen's Association, both East and West, and to be able to tell you some of the things that we are trying to do in the interests of the farmers at the Ontario Agricultural College. This business of farming is so different in this country to what it is in the older

lands, particularly on the Continent of Europe and the islands of England, Ireland, and Scotland. The Government has seen fit to establish the Agricultural College and Experimental Farm, and there seems to be the necessity year after year to go into experiments and work out new thoughts and new ideas, and try to see whether we have been making a mistake in the years gone by, and to work up to something bigger, better and broader in the future; and it is some of these things that we are doing day after day, that I want to tell you something about to-night. It was my privilege during the past season to go to the old country for the first time to look into some of the farm problems there, and see how they compared with ours.

In the first place there seems to be a dignity in the calling of agriculture there to which we have not attained. I had a letter from the Hon. Mr. Dryden to the herdsmen who had charge of the Queen's farm, and who now has charge of the King's farm at Windsor. It was my privilege to send the letter to Mr. Tait, and he requested me to go out the next morning. I noticed by the papers that the President of France, who was visiting England for the first time in his life, was visiting the King, and he was going to take him to the farm at Windsor that very morning, so thinking that would be a little too much for one day, that they could not stand so many celebrities, I dropped Mr. Tait a line stating that he said Wednesday, and wanted to know if it was a mistake. He said "No, that while every thing at Windsor was officially closed for a few days, he thought it quite the proper thing for a Canadian to come to his house, and that I might see the King and President on the farm." And would you believe me, that when the King and President of France drove up on the farm, they got out and had the cattle brought out of their stalls, the dairy cattle and the beef cattle, and they walked up to them and put their hands on individual animals, and the King by word of mouth pointed out to the President of France, as far as we could tell, and as far as Mr. Tait told us afterwards, in good live stock language, the best points of the different individual animals he was exhibiting. (Applause.) I have to say to you that if the business is not too small for the King of England, and if he considers it of such importance as to spend half a day with the President of France to show him the live stock and the dairy—and he took him to the dairy as well and showed him the milk and cheese and butter—if that business were not too small for the King of England, then you should, I think, never be ashamed of it and should never hold down your heads and say, "We are only farmers." (Applause.) Perhaps there has been too much in this country of that kind of talk. When men were at work with their hands in clearing up the country, it was not easy clearing the hardwood bush, for it was not easy to cut down, and it was not easy to get out the stumps and drain the land and get it into the splendid condition it is in at the present time; and for that reason they could not do this hard manual labor and appear like gentlemen, no matter what they were at heart. But I hope that day of judging a man by his clothes or occupation, no matter what it may be, has gone by, so long as it is honorable and that we will all work for the upbuilding of the Dominion of Canada. I believe the day has gone by when the farmer or any other artisan will be looked down upon, simply because he is doing his work. Farmers are coming to us at the Experimental Farm in increasing numbers. Every year between thirty and forty thousand come in the summer to look over the place and see how they like it and gain pointers and criticise our work. They take lunch, all of them. (Laughter.) They give us the benefit of their experience, and get the benefit of ours and go back home with a broader outlook and a better knowledge of certain things. Then as we have the privilege of going into Agricultural Societies and other societies in this Province. We meet them upon their own ground, and as we

discuss these matters. We find some points of difference between the people on the farm and the people living in the towns and cities, and knowing thy are all one blood and that nine-tenths of the people of the city start from the farm, we wonder why they sometimes differ, and do not understand each other. The city men forget that the farmer does not handle much money. His is a business of handling produce, and he has very little money to spend. His home is a place, and I hope always will be a place, where the city man can sit down and get a good square meal or two or three or stay a week, put his horse up and be fed hay and oats and no questions asked, but you are welcome to stay as long as you will. (Applause.)

I have seen men come into our house to discuss church questions with my father, and they talked with him very carefully about Mr. So-and-So only giving $5 when he ought to be giving $10; that he seemed to be a very generous sort of fellow; but they could not get $10 to save their lives. Another man would speak up and say, "I know John Smith, and you just get up a tea-meeting, and if he doesn't bring in a sleigh-load, and if his women folks do not cook for three or four days and use up all the pastry and flour in the house and use up everything to make pies and cakes, it is a wonder to me. They will bring in $20 worth of stuff if necessary and think nothing of it at all."

In the city homes you are not always prepared when four or five friends come in for supper. When you come in to see the banker or lawyer, does he ever say to you, just sit down till half past twelve and we will all go up to the house and have dinner. (Laughter.) Did the banker ever ask you that? I know he did not; if he did you would drop dead. (Applause.) He is handling large sums of money and making large sums of money, and would not think anything of asking you to go to the hotel and have dinner and he would not object to paying $1.50 for it, because he is handling money and not produce. So you must not say that the farmer is a stingy man and the city man is generous, but rather, they are both generous people but they are dealing in different things.

I am pleased to see the President of the Board of Trade here. I do not know that the Board of Trade are in a position to do just what I would like them to do, but I think many of the Boards of Trade in the smaller towns might reach out and take some of the farmers into their confidence, and especially creameries, cheese factories and canning factories, and get the bankers to co-operate with them. Make it just as convenient for the farmer to organize and bring the farm produce into the towns, because I think this would be better business than bonusing shoe factories and mills. I believe if there was closer co-operation it would be better for both parties. I am pleased that the city of Brantford and town of Orillia, through their Boards, are doing things of this kind, and inviting people to come to the Board of Trade meetings and speak on agriculture, and I believe it would be for the benefit of all.

Three years ago we began to get, not for the first time, but in increasingly large numbers, letters from many farmers throughout Ontario, stating: "We have cleared up our farms. We have removed all the stumps, and we have removed the stones and got our entire farm under cultivation, and yet we have certain fields that are low-lying and that are not giving any better returns than they gave to our father forty years ago, and we want to know if it would pay to tile drain these fields." We asked the Government for assistance to send out men so that it would not cost the farmers anything but the actual expense of that man travelling from the College to his farm and his board while there, so that he could survey the fields and

give the farmer a drawing of every field, and tell him the quantity of tile required and give him a working plan of how to go about it and drain the fields; and this has become so beneficial that we have asked for an increased grant so that we can have four men in the field at one time. One man from Victoria County writes, "I had a field in which my father before me and I for the last twelve years have not been able to plant until my neighbors and myself had finished all our other fields. It was damp and low, and needed draining, and I either had to leave it in hay and take a chance on the crop or pasture it. You sent your man to us and we drained that field at an expense of $14 per acre. It is now six weeks earlier in the spring, it will grow any crop that will grow anywhere else in the neighborhood, and in three years we have, by the increased earnings of that field alone, paid for the tiling of it." Adding together all the low spots and swamps in Ontario, there are hundreds of thousands of acres that might be cropped, and you know the swamp land drained contains the best soil and would be worth a great deal of money.

Mr. James, the Deputy Minister, discovered from the statistics a few years ago that the potato crop was falling off in this Province of Ontario, until at the present time we are actually importing potatoes into the Province, and at one time we exported them. Toronto takes from two thousand to three thousand bags of potatoes every day, and when I say to you that a large percentage come all the way from the Province of New Brunswick, you will begin to realize something is wrong. Mr. James sent men throughout the Province to find out the trouble, and he found that the difficulties were two-fold. One was that the blight had been so prevalent that the farmers had given up growing potatoes, and the other was that there were so many different kinds and varieties grown, over ninety different sorts being planted, that in many instances they could only be used for home consumption because you could not get enough of any one kind to ship to a commission agent. The principal reason seems to be the blight. That young man discovered that in some places they were not subject to blight, and he learned that there were in the Province of Ontario some varieties that were almost blight proof. He found that sixty-four per cent. of all the varieties were strictly subject to blight, and thirty-six per cent. were blight proof, and the Department is introducing these facts, which ought to increase the growth of potatoes. Through the Experimental Union, which was started at the College and has grown out from it, we now have four thousand five hundred farmers growing varieties of crops upon their places from seed which is sent to them by us every year, and they report back to us in the fall as to how they develop, the actual weights in grain and straw, etc., and by this means we get an idea of what can be done in the different parts of the Province. We plant small seed in one plot, and larger seeds in another, and then watch the results. There was a difference in favor of the large seed of nineteen per cent., and the difference in plump *versus* shrunken seed of twenty per cent., and yet it is pretty hard to get it into the heads of some farmers that it would be money well saved if he would in the early spring or in the winter, separate the seeds and plant only the large plump seed, knowing that it would benefit their business to the extent of twenty per cent. We have fallen down during all these years by working by rule of thumb, and by not knowing these little tricks of the manufacturing trade—knowing only how to work hard, work honestly, and intelligently, and overlooking some of these small things which made the difference between the profit and loss. We have discovered after a number of years trial that by planting spring wheat, oats and barley and peas, in the order named, one week apart in the spring we get an average of forty bushels per acre, and

by planting spring wheat, barley, oats and peas, in the order named, we get but thirty-five bushels to the acre. If that one item alone were known throughout the country, and if all the farmers planted in the second order instead of the first, it would make a difference in the Province of Ontario alone of 55,362,309 bushels every year, or nearly as much as is produced of wheat in the Province of Manitoba alone. By taking samples of the best kinds of oats and peas and planting them here and there throughout the Province in an experimental way, and finding out what is the best and advocating that and giving that information to Mr. Putnam and the workers, in Farmer's Institute meetings, we are now producing an average of 19 bushels per acre more than ten years ago. There has been produced in this Province more than one hundred million bushels of oats, and if we put that increase at 20, to make it even, at an average price of 40 cents a bushel you have a very large annual increase, and thus has been brought about by the work of the Experimental Union and Dominion Experimental Farms and other educational agencies an increase in the oat crop of $8,000,000.00.

One of the great problems we have to solve in this country, and one that the Scotch Commissioners referred to, is that we do not seem to be husbanding the fertility of our farms. We seem to be perfectly satisfied to get crop after crop, and return the amount of fertility we have, but never study as to the exact number of animals we ought to keep on every farm to keep the farms up to their best possible state. The Scotch Commissioners said they were shocked at the statistics, both in this country and the United States. While old England gives an average of over 30 bushels to the acre, Ontario has fallen down to 20 bushels, and the States of the Union have only an average production of 12 bushels. They stated that they could hardly understand that in a new country, well watered, with plenty of nitrogen, potash, and phosphoric acid, we are not keeping up the fertility of the soil. We have been trying to induce our farmers to grow clover crops and vetches, lupines, beans and peas, crops that take the free nitrogen from the air and deposit them in the soil. We have found that many soils in this Province would not produce clover. During recent years agricultural science has discovered that there is a bacterial growth in the roots of clover, and we find that we can take that bacterial growth and take them to the laboratory and breed millions of them, and then put them in little bottles and send them out to the farmers, who can mix them with water and sprinkle all the seed before introducing to the soil, and that will make the clover grow. It sounds like a fairy tale, and yet it is being done every day. We have sent out hundreds of these bottles. These are some of the things we are trying to do, and we want to do more. You want a doctor in your neighborhood, and you well know the necessity for lawyers; yet we have never thought it necessary in this basic business of Agriculture to have somebody to send to look after your land when it is sick—somebody to give you advice just when you have need of it. We hope to have a graduate of the Agricultural College in every county in the Province, who will be able to give the farmers the information they want for the up-building of this greatest of all industries, Agriculture. (Applause.)

Mr. Brewster, M.P.P.: I am sure it is with a great deal of pleasure that I am here to-night to say a word to this Convention of Dairymen. I was very much pleased with the address we have just listened to from Mr. Creelman. I am sure the Province is to be congratulated on having a man like Mr. Creelman at the head of our Agricultural College. You have heard words of welcome from Mr. Cook and the Mayor on behalf of the city, and I would like to welcome you on behalf of this county for the farmers of

Brant. We have in this county as progressive farmers and dairymen as can be found in any part of the Province of Ontario. About fifty per cent. of the people of this Dominion are engaged in agriculture, and there are about two billions of money invested in agriculture in the Dominon of Canada. The annual produce of the farmers of the Dominion is over three hundred million dollars, and I find the dairymen are doing more than any other people to make the Province of Ontario great. You have exported to Great Britain some twenty-four million dollars' worth of cheese and about four million dollars' worth of butter, and the city of Brantford and the county of Brant cannot extend too hearty a welcome to the members of this Association. The agriculturists of this Province have four times as much invested as have all other manufacturers of the Dominion of Canada, and your meeting here in the city of Brantford will promote a feeling of greater friendliness between the manufacturers and agriculturists of this Province.

Sir John Macdonald used to say he was a working man, and so when anybody asked him what he made he said "I am a cabinet maker," and in that sense I am a manufacturer. If the manufacturers will make the best goods, and if the dairymen will make the best butter and cheese, and if the legislators will make the very best laws, then all three together will combine to make this old Province of Ontario great. (Applause.) We hear too little of our Province, and too much of the great Northwest. We have in Ontario a Province as great in extent as France and Germany. We have in this Province a greater extent of territory than the United Kingdom of Great Britain and Ireland. We have a Province blessed with the best climate the world has ever known. On the south we are as far south as sunny Italy, and we go north as far as the frozen north. We have a great rainfall, and drouth is unknown. To the north we have a great clay belt of sixteen million acres, and I see no reason why our people should leave this Province and go to any other Province of the Dominion to help build it up. Wherever I am, I intend to raise my voice on behalf of the Province, and I ask you as agriculturists to stand by your own Province, be loyal to it. Remain here and encourage your sons to remain here and help build up Ontario. (Applause.) Do not be satisfied with what you have done in the past, your motto ought to be "Excelsior." Your aim and ambition ought to be to make the very best butter and cheese that the world can produce. You have the greatest market in the world in Great Britain, and in that respect your motto ought to be "What we have we'll hold." Do not be ashamed of your profession. You have one of the noblest. Nobody is more independent than the farmers. Why is it that boys leave the farm? Because their parents point to the man in the city, and say, "There is a man that does not have to work hard; go to the city and have an easy life." Do not have any more of that talk in the future. I hope that you will have greater success than you have had in the past. We welcome you here to Brantford, and we trust that you will continue your good work, and that this Association will prosper. (Applause.)

ADDRESS.

By C. C. James, Deputy Minister of Agriculture, Toronto.

I felt as I listened to the speech delivered by Prof. Creelman that perhaps, after all, I must be getting pretty old, when one who had formerly been a student under my care could get up and deliver an address such as

you have listened to to-night. And then when Mr. Brewster came on, who was a fellow student of mine some 25 or 26 years ago, I said, "There is no doubt about it at all." (Laughter.) And yet I think I take a little more pleasure in coming back to the Dairymen's Convention each year. There must be something in this new method of schooling that attracts the older people. It brings out the grey haired old men year after year. What does this Convention mean? What have you come out for? You have not come here for pleasure or entertainment, because goodness knows you can get better entertainment elsewhere. You come here to learn how to make more money. Has not that been the motive that has influenced the majority of you in coming to this Convention? You have said, "If I go to this Convention there is a probability that I will learn something that will help me to make more money next year." And after all that is what we are after, whether we are doctors, lawyers, manufacturers, or dairymen. That is the one thing that brings us together in connection with these Conventions. Are you learning in connection with these Conventions how to make more money? It will altogether depend upon yourself. Why do not we make more money out of the business? Simply because we do not always take home and apply to our work all the principles that are taught us at these Conventions. They are making wonderful progress in the Western Provinces, and we are glad to know it, because it means a better home market for the people in this country, for certain things that we can produce here they cannot produce in the West. We are not standing still in this Province by any means, although judging by some of the articles in the papers one might think that the prosperity of this country depended on the wheat crop of the West. I have seen in the last two or three weeks editorials forecasting good times, simply because the Western Provinces produced so many bushels of wheat, oats, and barley. Well, we produced here in the Province of Ontario, last year, as much again as all these three Provinces put together (applause), and we intend to increase and grow still more, and we would be very foolish to sit down and allow these young Provinces to get the start of us. We have in the Province of Ontario possibilities of a more varied nature than any Province in the Dominion or any State in the Union. We can grow live stock and produce dairy products, and fruit and grain and vegetables, and there is no other similar section on the continent of America where you will have all these varied lines of agriculture equally developed. Of course we cannot grow wheat with the Prairie Provinces, but they cannot produce live stock such as we can. We cannot produce a few of the fruits of California, but we can produce fruits that California cannot produce. Go over the continent from east to west and north to south and you cannot find any part of it that will compare with this old Province of Ontario in natural resources. (Applause.) I have relieved my mind of that. Ontario is all right. (Loud applause.) We are chasing the almighty dollar. It is pretty hard for a man who has not the price of a meal in his pocket to be moral. It is pretty hard for a man who has not the price of a meal in his pocket to sit down and enjoy reading the newspaper. It is pretty hard for a man who has not the price of a meal in his pocket to take any enjoyment out of life at all. That is the prime necessity. Let us make as much money in Ontario as we possibly can. That means more butter and more cheese, better butter and better cheese. You say, that is an easy matter. Let some man tell us how we can make that finished article. Better cheese cannot be made without good milk, and you cannot make more of it unless you have more milk. Where do you get the milk? That brings you to the next step, more cows, and better cows. Mr. Whitley knows more about the question of testing cows

than, I suppose any other man in Canada, and that is the reason you had him here; and I hope you will take home, and that you will put into practice, what he is trying to teach to you along the line of more cows and better cows. The cow does not produce milk out of the air. The most interesting book I ever read was one published two or three years ago called "The Fat of the Land," and I would advise you to get hold of that book and read it. The author of that book simply sets the old cow up in front of him as a machine, and he says that machine has to produce as much as possible. The more she will eat the more she will produce, and that brings us to the question of food, more food, and better food. Where are you going to get that? From the land. How are you going to get that from the land? Bring into operation those portions of your farm which are now lying idle, underdrain them, give them better cultivation and a proper system of rotation, and adopt the system of planting only the best seed. You must work intelligently and thoroughly from the ground up.

After all this dairying is not such a simple question. It is a process of manufacturing that cannot be equalled by the highest quality of manufacturing carried on in any factory in the city of Brantford—producing food out of the air, and producing milk from the cow. It takes far more skill to turn these products of air, water, and soil into finished butter and cheese than it does to carry on the most intricate manufacturing process that is carried on in the city of Brantford. If you are not making a success of it, it is because you are not studying some one of these important points. You are perhaps being careful on one point, and neglecting another. If we could only get all the dairymen to put their farms in first-class condition, and if we could get them to get rid of these old cows that are simply pensioners upon the farms, and give the good cows a fair chance by liberal feeding and handling, and being properly milked, and if we would equip our factories in the very best condition, we would get more of these almighty dollars, and instead of producing thirty-five millions of dollars of products, we would be turning out forty, fifty, or sixty millions of dollars' worth. There is no limit to it. It would be a great thing for the city of Brantford if we should bring four or five million dollars every year into this city and put it into the pockets of the manufacturers; because there would be a lot of people in Brantford who would have money to spend and the farmers would perhaps ultimately get their share of it. It would take a long time to get it distributed about the country; but suppose we take this five million dollars and put $100 into each farmer's pocket, what would be the result? What have the bankers been telling us in their annual reports? Why, that good times are coming again to Canada, because the farmers have had a good year. That is what they are staking their future on. They are not saying we are going to have good times in this country because half a dozen men have made a million dollars up in Cobalt. That would not make any country prosperous. But if you took a few millions and distributed it equally into the pockets of the farmers, good times will come like a flash. Why? Because the farmers are not going to keep it. They are going to hitch up their horses and then go into town to do some shopping. They are going into the bank to pay that little note; and if they haven't a note to pay they will go to the grocer's and buy some groceries and to the dry goods store to get a new dress for the wife, first of all; and then of course he will get a new suit for himself, and before you know what has happened, that $100 is out of the farmer's pocket and got into circulation and good times have come. The key to it is not the money, but the man. And when I look into the faces of the men here I say there is hope for the dairy business

because you have it in your faces. I venture to say that ten years from now fifteen or twenty per cent. of you will not be living. There are men in this Convention who were not here ten years ago. You are coming and going to school at a late age; you are geting up pretty well in years, and it is hard for you to learn because you have fixed habits. Where are the boys? There are a few here, and they will not forget the things they hear. If you have come to this Convention and left your boy at home, just go back and tell him, "I am sorry I didn't take you down to this Convention; you ought to have gone there in place of me, and I might better have stayed at home." Do you wonder, after all, why some of these boys should begin to think they had better leave the farm and go to town, if they do not get a chance to come to these Conventions, and are not taken on the summer trip to the Agricultural College? The boys at home are the ones we want to get hold of, because, if we can get them drawn into this agricultural work and start them off in the right way, ten, fifteen or twenty years from now they will be standing on this platform talking dairying as the dairy experts of the farmers of that day. *Do not forget the boys at home upon the farm.* Why do you men come to this Convention without your wives? You come away to have a good time, perhaps. (Laughter.) Do you mean to say you are carrying on your farm work without the co-operation of your wives and daughters? Are you the whole thing in agriculture? Is not your wife, after all, of a little more importance upon the farm than you are? Be honest with yourself, and turn that over in your mind. If we can get your wives and daughters stirred up on this dairy question you simply won't be untidy, you will simply have to do what you are told. (Applause.) The city man's wife does not want him to talk shop at home. She says, "Goodness gracious, leave your business at the office; let us talk about something else." And the city man's wife very seldom goes to the factory. Where is the headquarters of the farm? It is right inside the home. The woman is on the spot all the time, and if you don't get her interested in this work things are going to go awry. We have organized Women's Institutes, and they have beaten the Farmers' Institutes all hollow. So the life of the farmers' wives in this Province is being improved. The women come to the meetings at Guelph with their note books and pencils, taking down whatever is said, and they are working for the development of the useful side of farm life. We are trying to get away from farm isolation and trying to throw something into the life of the farmer besides mere money making. The men of means in the city of Toronto are going out north, east and west and buying farms where they can go in the summer time and live next to nature. What is the use of going through this world at all unless we get enjoyment out of it? I hope that as a result of this Convention the members of the Western Dairymen's Association will take home with them, not only the few principles we have tried to lay before you, but that you will take home with you a spirit of determination which will give you more pleasure in your work, and that you will get more out of living than you have in the past.

THE BAD AND GOOD IN DAIRYING.

By Miss Laura Rose, Guelph.

(Illustrated by Lantern Slides.)

It is always a pleasure for me to attend a Dairying Convention. I feel I am with my friends—people interested in a like industry to myself—and from whom I gain fresh inspiration for my work.

In presenting this illustrated talk, I have one regret to make. It is said that all we do serves us some good turn in life, and I am sorry to-night that I have not had more personal experience in talking in the dark. (Laughter.) I found that in searching for photographs suitable for slides, it was easier to get those representing the good than the bad, and so in my series of pictures the good predominates, and this is as it should be in dairying.

There is nothing like making a good beginning, so I take pleasure in introducing to you "Boutsje Pieterje de Kol," the best cow in Canada. She is a Holstein in the College herd, and gave in 1907, 20,778 pounds of milk, which if sold at 4c. per quart would have made a profit over the cost of feed of $259.54. Not failure, but low aim is crime, and the farmer sins in that he seems not to have an ideal higher than a cow which will give but three or four thousand pounds of milk a year.

This fine Aryrshire is also of the College herd. Instead of "Dainty 2nd," I would have liked to have shown you "Denty 10th," whose record for September was 1,301 pounds of milk of 5.6% butter fat, equal to 85 pounds of butter, or nearly three pounds a day.

Through the courtesy of B. H. Bull, I am able to let you see his imported Jersey, "Primrose," which won first place at our large shows this fall.

This beautiful Guernsey is of the famous A. G. Lewis' herd, of Geneva, N. Y.

You will have noticed in all these fine specimens of the dairy breeds, the indications which bespeak constitution, appetite and heavy milk flow.

The good cow should have a good barn and yard. By contrast we can see the advantages of proper housing. Here we have a clean, well drained yard, modern buildings, and large silo. Look for a minute at this old dilapidated barn—the hay hanging from the rafters, the rigid stanchion, the whole place having a look of neglect. The one great essential in a cow stable is light; above all else I emphasize its importance. Darkness tends to *dirt, dampness*, and *disease*. *Sunshine* speaks of health, cleanliness, contentment. The motto over every stable should be, "Let there be light."

This picture brings to mind the oft asked question, "Does it hurt to let the calf be with its mother?" Yes it does. The cow has the maternal instinct in her just like all mothers. She gets fond of her baby, and will fret over its removal if left with her for only a few days. The calf is not an exhaustive milker, and does not tend toward making the cow produce her largest flow of milk.

This little lad is apparently enjoying milking. Still, it is an unwise practice to allow small children or weak handed women to milk good cows. They have not strength enough to excite the nerves, so that the last process in the secretion of milk may take place. Many good cows are spoiled by being indifferently milked.

I was asked once at a meeting how a cow should be milked. I replied, "Always by a man." I believe, however, I have changed my opinion along this line just a little; at least I am weakening. The more I study and come into contact with the dairy business, it seems to me the more I see the need of women being interested in it. I think the industry has suffered by the women leaving the milking stool. A woman naturally has a higher ideal of cleanliness and more patience and gentleness than a man. These qualities are all needed in the stable. Lest I be misunderstood, I still think the most of the milking should be done by men, but it should be done properly.

Many follow the practice of milking the first stream of milk from the teat into the milk pail. This should not be done. While the cow is lying down on the stable floor, which is often far from clean, bacteria of the worst sort find their way through the small opening in the teat as here shown in this cut of a portion of the udder. In the milk in the canal of the teat germs find ideal conditions to thrive and multiply. These first few streams may cause serious trouble. Give them to the barn kitty, for while harmful to the milk supply, they will not kill the cat. A glance at these two plates made from the fore and middle milk shows the enormous number of germs in the former and the few in the latter.

Another means of producing clean milk is to curry the cows. These animals appear to be enjoying their grooming—and why not clean off a cow as well as a horse? It makes them healthier, and they do better on the same amount of food. Much dirt finds its way into the milk pail during the process of milking, falling from the udder and flanks. To wipe the udder and flanks with a damp cloth arrests the dust, and makes a marvellous difference in the bacterial content of the milk, as shown by the following slides. A few hairs alone can do considerable damage, if they be as dirty as this cow's hair.

Many people have every condition good but the atmosphere. I would far rather have clean air than a clean stable floor. The milk has to pass directly through the former, but does not touch the latter. To sweep during milking, or bring in hay, or clean out the stable is a bad, yes, a *very bad* practice. It makes the air just as dirty as can be, and the streams of milk create a current and carry down into the milk pail millions of particles of dust laden with bacteria. This is the great reason it is hard to get good milk in winter—the stable air is foul.

With the clean atmosphere should go the clean milker. I am too sensible a woman to ask that all should dress in white suits similar to this man; but washable clothes should be worn, and they should be kept reasonably clean.

Lately there has been much agitation over the proper kind of milking pail to use. Certainly this wide flaring one exposes a very large surface of milk to catch dust, etc., while this Freeman pail, with its small hooded opening, minimizes the danger.

The invention which has made dairying more of an industry, and has revolutionized the handling of milk, has been the introduction of the cream separator. But the separator is not an unmixed blessing. In fact I firmly believe many are not producing as good a quality of cream or butter from the separator as they did from the deep can. This is not the fault of the separator, but due to ignorance or carelessness. In the first place the separator is in many cases not properly washed. Just lately when I was advocating the necessity of washing the machine after each time of using, a man in

the audience shook his head at me. I said "You may shake your head if you like, but all the same it must be done." The badly washed bowl or pan is only a breeding place for germ life.

A little sterilized water was put into such a can, rinsed around, and the following slide revealed the countless throngs of germs. One fancies he sees minature tadpoles, lizards, snakes, and fishes, so bad is the condition revealed. All tinware must be well washed and scalded if we wish for good results.

Another detrimental practice is the lack of cooling the cream after it is separated. This accounts for many of the bad flavors and odors found in cream and butter. We must urge our patrons to quickly and thoroughly cool the cream if we wish a choice finished product. To set it in the shed or out of doors even on a cold day does not do. It must be set in cold water and frequently stirred.

Pasteurization is a great boon to the butter maker, giving him a clean seed bed in his cream, in which, by using a pure culture, he may develop the flavor he desires. These plates show up splendidly the effectiveness of pasteurization, no germs present, while the plates from raw milk abound with life.

It is well to keep before the public eye the necessity of a careful watch of the water supply. The surface surroundings may be apparently clean and tidy, but they may be the whited sepulchre. Teepage from the stable and pig-pen often finds its way to the well. This water is used in the dairy, and contaminates the milk, causing in some cases outbreaks of fever and other sickness.

This dash churn is a relic of the past, but pleasant are its memories; while the barrel churn speaks of the present. I will let my audience judge for themselves whether the next picture represents the good or bad in dairying. For my own part I think it looks pretty nice (laughter), and who blames them that the butter does not come. (This slide represents love-making, and the churning neglected.)

Here we have a glimpse of a class of Macdonald young ladies getting a lesson in the O.A.C. farm dairy, where we endeavor to point out the bad and teach the good.

We began with the best cow in Canada, and now will show what is hoped to prove the best cow in the world, "Pontiac Rag Apple," a pure-bred Holstein, who as a two year old gave 18,252 pounds of milk of 4.22 per cent. fat, and who was sold for $8,000.

How beautiful it this pastoral scene—the fine cattle, the good pasture, the grateful shade, an environment of the best, and from which the best may be expected.

The most precious thing in all the world is the dear baby in our home. Think of this happy little chap sucking his bottle which perchance is filled with milk, milked from a dirty cow in a dirty stable, by a dirty man. I plead for the babies that we give them clean milk. Let us banish the bad, and achieve the good in this great dairy industry.

NOMINATING COMMITTEE.

The following were then appointed as a Nominating Committee: Wm. Bothwell, Arthur Gracey, Robert Myrick, Harry White, George Cousins.

REPORT OF COMPETITIONS OF CHEESE AND BUTTER.

Prize List.

	Total score.
September White Cheese:	
1st Prize.—John Cuthbertson, Sebringville	95.32
2nd Prize.—Mary Morrison, Newry	95.15
3rd Prize.—G. R. Stone, Curries	94.98
4th Prize.—A. W. Darroch, Zenda	94.82
September Colored Cheese:	
1st Prize.—J. T. Donnelly, Union	95.82
2nd Prize.—C. Donnelly, Scottsville	95.32
3rd Prize.—Mary Morrison, Newry	95.15
4th Prize.—Harry Donnelly, Union	94.50
October White Cheese:	
Tie for 1st and 2nd Prize.—J. T. Donnelly, Union	94.82
Mary Morrison, Newry	94.82
Tie for 3rd and 4th Prize.—Jos. Skelton, Thorndale	94.49
C. A. Barber, Hickson	94.49
October Colored Cheese:	
1st Prize.—J. E. Stedelbauer, Listowel	94.99
2nd Prize.—J. B. Doan, Birnam	94.16
Tie for 3rd Prize.—W. J. Goodwin, Ripley	94.15
C. Donnelly, Scottsville	94.15
56-lb. Box Creamery Butter:	
1st Prize.—Jno. Cuthbertson, Sebringville	94.96
2nd Prize.—R. Johnston, Bright	94.65
3rd Prize.—A. G. Patterson, St. Thomas	94.
Tie for 4th Prize.—R. A. Thompson, Atwood	93.48
J. B. Doan, Birnam	93.48
20 One-Pound Prints, Creamery Butter:	
1st Prize.—Jno. Cuthbertson, Sebringville	94.66
2nd Prize.—R. A. Thompson, Atwood	93.99
3rd Prize.—A. G. Patterson, St. Thomas	93.82
4th Prize.—E. M. Johnston, Innerkip	93.65
56-lb. Box, October Creamery Butter:	
1st Prize.—A. G. Patterson, St. Thomas	95.65
2nd Prize.—W. G. Medd, Winchelsea	93.99
3rd Prize.—J. R. Almont, Welland	93.48
4th Prize.—E. J. Sleightholm, Strathroy	92.99

Special Prizes.

By The Heller & Merz Co., 22 Cliff St., New York:

To the butter-maker securing the highest score on butter in Classes III and IV, colored with Alderney Butter Color, $10.00 in cash.—A. G. Patterson.

To the butter-maker securing the second highest score on butter in Classes III and IV, colored with Alderney Butter Color, $5.00 in cash, C. Richardson & Co., St. Marys, Canadian agents for Alderney Butter Color.—John Cuthbertson.

By the Ballantyne Dairy Supply Co., Stratford, Ont.:

One case of Hansen's Rennet Extract, to the cheese-maker securing the highest score on September White Cheese, Class 1, Sc. 1.—J. Cuthbertson.

One case of Hansen's Cheese Color, to the cheese-maker securing the highest score on October Colored Cheese, Class II, Sec. 2.—J. E. Stedelbauer.

By C. H. Slawson & Co., Ingersoll, for D. H. Burrell & Co., Little Falls, N.Y., Manufacturers of Chr. Hansen's Rennet Extract and Color:

One case of Hansen's Cheese Color, to the cheese-maker securing the highest score on September Colored Cheese, Class 1, Sec. 2.—J. T. Donnelly.

One case of Hansen's Rennet Extract, to the cheese-maker securing the highest score on October White Cheese, Class II, Sec. 1.—J. T. Donnelly and Mary Morrison.

Note.—All cheese competing for the special prizes offered by The Ballantyne Dairy Supply Co., and C. H. Slawson & Co., must be made with Hansen's Extract and Color. No special cheese required.

By the J. B. Ford Co., Wyandotte, Mich.:

One Three-piece Carving Set, with staghorn handles, sterling silver mountings, to the cheesemaker who is a regular user of Wyandotte Dairymen's Cleaner and Cleanser, having the best finished and most stylish looking cheese on exhibition.—J. T. Donnelly.

One Three-piece Carving Set with staghorn handles, sterling silver mountings, to the butter-maker who is a regular user of Wyandotte Dairymen's Cleaner and Cleanser, having the neatest and most attractive exhibit of butter.—A. G. Patterson.

Note.—All exhibits are eligible for these two special prizes.

By the Canadian Salt Co., Windsor, Ont., E. G. Henderson, Manager.

$30.00 in cash, to the butter-maker securing the highest score on butter exhibited in any class.—A. G. Patterson.

$20.00 in cash, to the butter-maker securing the second highest score on butter exhibited in any class.—J. Cuthbertson.

A medal to the cheese-maker securing the highest score on cheese exhibited in any class.—J. T. Donnelly.

Note.—No special cheese or butter required.

By The Western Salt Co., Mooretown, Ont., A. N. Leach, Manager:

One barrel Purity Cheese Salt, to the cheese-maker securing the highest score on September White Cheese, Class I, Sec. 1.—J. Cuthbertson.

One barrel Purity Cheese Salt, to the cheese-maker securing the highest score on October Colored Cheese, Class II, Sec. 2.—J. E. Stedelbauer.

One barrel Purity Dairy Salt, to the butter-maker securing the highest score on fifty-six lb. box creamery butter, Class III and IV, Sec. 1.—A. G. Patterson.

One barrel Purity Dairy Salt, to the butter-maker securing the highest score on twenty one-pound creamery prints, Class III, Sec. 2.—J. Cuthbertson.

Note.—No special cheese or butter required.

Cheese Buyers' Trophy—Challenge Cup, valued at $150:

To become the property of the exhibitor of cheese at the Winter Dairy Exhibition who shall receive the highest score three times, or twice in succession.—J. T. Donnelly.

Won 1903 by Frank Boyes; won 1904 by R. H. Green; won 1905 by O. Schweitzer; won 1906 by J. Patton; won 1907 by J. E. Stedelbauer; won 1908 by Mary Morrison.

INSTRUCTION AT CHEESE FACTORIES IN WESTERN ONTARIO, 1908.

By Frank Herns, Chief Dairy Instructor, London.

I take pleasure in presenting my second annual report of instruction in Western Ontario. This past season will be remembered for continued high prices for dairy products, successful from the patron's standpoint, and a somewhat more successful one for the maker. The patrons of a number of factories have shown their appreciation of the work done by the makers by increasing the price for manufacture. There are still many factorymen under-paid. Many patrons are beginning to realize the importance of having summer soiling crops, or silage to supplement the pastures during the dry season. More silos have been built and more corn has been raised in our dairy districts during the past year than for many previous years. This is a good sign of progress.

The instruction work was carried on along practically the same lines as last year. The same number of instructors were employed, and very little change made in the grouping of the factories. The instructors, as usual, spent a few days at the O. A. C., Guelph, before beginning work, and appreciated very much the lectures given by the professors of the College. Considerable time was given to discussing the work for the season, and

uniform methods of instruction were decided upon. The quality of the cheese up to the end of June was fine, but when hot weather came in July we had the same difficulty as last year with small round holes in the cheese at a few factories. This difficulty was discussed at the district meetings, and the general opinion seemed to be that the remedy was to get a better quality of milk, cut the curds fine, use the ¼-inch curd knife, get the curds firm before acid came on, not draw the whey to the surface of the curd too soon, get rid of all surplus moisture in the cooking, if possible, stir the curds sufficiently in the sink before piling, hold a little longer before milling, get the curds well flaked and give plenty of time before salting to get the curds well matured and free from moisture. Some of the late fall cheese do not get sufficient attention in the matter of curing before being shipped. Some of the buyers complained bitterly of the neglect on the part of some of the makers along this line. The fall cheese should not be allowed to go below a temperature of 58 or 60. The boxes in one section were also complained of by the buyers.

Very few acidy cheese were reported, and with the exception of a few weeks during the hot weather the quality was maintained, and in a number of cases improved. September was an exceptionally hot month, and the quality of the cheese suffered accordingly. When will the time come that changes in temperature will not have such an effect on the milk supply? The finish of the cheese is improving, and the August and October cheese were exceptionally fine. If we can ever get the milk in hot weather coming in good condition and cool curing-rooms established there is no reason why finest cheese could not be made during the whole season. In visiting cool curing-rooms during the very hottest weather one could not help but notice the fine smooth texture of the cheese, while in curing-rooms that were not protected from the heat the cheese were not nearly so fine. It seems to me cool curing would have as much to do with improving hot weather cheese as the milk supply.

It is discouraging to see thousands of cheese during hot weather well made, nicely finished, then placed in curing-rooms the temperature of which injures the texture and flavor. Evidently buyers will have to pay more money for cool-cured cheese, if cool curing-rooms are to increase in number.

Considerable improvement is shown at the factories in the matter of new and cleaner whey tanks, new floors, inside and outside appearances, new wells, better equipment, but we still have a few factories that are not kept up-to-date, and a few makers who do not keep clean and tidy what they do have. The owners and makers in these cases do not seem to realize the effect on the patron of having things in and about the factory clean and tidy. It is inconsistent for us to suppose that the patrons will improve in the care of the milk if the personal appearance of the maker, the unclean whey tanks and the untidy condition of the factory in general is a direct invitation for the patron to do likewise, and be untidy and careless in his methods of producing the milk.

I visited a number of factories where the sanitary conditions in the way of sewage disposal, impure water supply, and so on was very bad, and in every case these conditions were made satisfactory without compulsion. We do not seem to have much difficulty in getting some of the worst abuses remedied, but there is such a wide difference in men that it seems very difficult to get all the makers up to a point where all the factories can be pointed out with some pride as being kept absolutely tidy and clean, and fit places for making dairy products. There are a few factories that although they cannot be said to be unsanitary, yet are kept in such an untidy condition, that it is certainly discouraging to the instructors in their work.

The question of shipping green, immature cheese is important, and the cool curing of cheese and the cooling of milk is no doubt the most important problems in our dairy work to-day. Yet they seem to be two conditions very slow to improve. It is to be feared that the continuous shipping of green cheese will have a tendency to lower the standard of milk taken in at some of our factories, some makers reasoning that as the cheese are going out early, defects caused by the milk will not show before the cheese are shipped, and therefore a more inferior quality of milk is often accepted. Again, buyers ask for the cheese to break down early and in order that the maker may get green cheese to break down faster he is inclined to leave more moisture in the curd; and since the cheese are going out quickly he salts the curd too early, thus giving rise to open weak bodied cheese. The efforts of isolated individuals can have very little effect on these conditions, improvements must be brought about by the united efforts of every one in the business. The storing of ice on the farm is not increasing as rapidly as it should, neither is the building of cool curing-rooms. These are two points where a determined effort should be made to create an incentive for improvement. The benefits of storing ice on the farm does not seem to be well understood by the average patron. He needs ice as well as the city resident, to preserve food products. If some co-operative system of handling ice could be devised by which patrons could more easily get a supply for themselves and fill the ice house at the cool curing-room, it would be a great step in advance. Ice put up by a few patrons does accomplish some good, but it does not seem fair that a few should put up ice while the majority are negligent in this matter. Some such system, if it could be worked out, would encourage everyone to put up ice, build a milk stand near the ice house, and the benefits would soon be realized. A determined effort along this line is certainly important, for until such time as the milk is cooled in hot weather with cold water or ice, and the cheese cured in cool curing-rooms, further improvement in quality will be slow. Considerable improvement is reported in the quality of the milk, but when the hot weather arrives, too much gassy, over-ripe milk is still sent to the factories.

The system of pasteurizing the whey advocated last year has worked out successfully. The work was taken up in 55 factories. The press also have taken an interest in this subject and have helped to make public its benefits. We find where the whey was properly pasteurized it went into the patrons cans with an average acidity of .4 per cent. Some factories were able to return the whey with an acidity of not more than .25 per cent. Where the whey was not pasteurized the average acidity as it went in the patrons' cans was 1.15 per cent. As high as 1.7 per cent. We also find that where the whey is pasteurized it goes into the patrons' cans with a fat content of .22 per cent., and in a condition easy to handle. On the other hand where the whey is not pasteurized it goes into the patrons' cans with an average fat content of only .09 per cent., as low in some cases as .03 per cent. The latter means very sour, ill-smelling, gravity skimmed whey. A very doubtful argument against pasteurization of the whey is that the patron might not wash the cans as well as formerly. This is equivalent to saying that the more filthy the whey tanks are kept the more likely are the patrons to pay particular attention to properly washing the cans. In dealing with this matter I went straight to the men who produce the milk, to the women on the farm who usually have to wash the cans, who are in the best position to know the exact condition in which the whey has been returned for many years past. I sent out 1,500 letters to twenty-three factories where the whey was pasteurized for the first time, asking some twenty questions relative to the claimed improvement in the whey, and out of several hun-

dred answers received, the opinion was almost unanimous that pasteurizing the whey was a distinct improvement, and some expressed their willingness to pay their share of the cost to continue this system at their respective factories. I do not think the opinion of these patrons should be ignored. It seems somewhat inconsistent to ask patrons to improve in the methods of caring for milk, and then persist in putting into their cans this old, sour, foul smelling gravity skimmed whey. We may rest assured that human nature will always creep in, and some patrons will fail occasionally to entirely get rid of injurious bacteria from the cans. It is therefore reasonable to suggest that all patrons be put on the same footing so far as the whey question is concerned, and return them sweet germ free whey so far as possible, or so far as the practical system in use and the temperatures employed will making it germ free; then look after the careless ones and see that they take proper care of the milk and cans. Then the patron who is guilty of sending yeast infected milk may easily be detected by the curd test and dealt with accordingly. The temperature of 155 degrees to which the whey is heated must have in the time before it cools an influence in freeing the tanks and whey from large numbers of bacterial life, although not all. This system has practically annihilated the bitter and yeasty flavor formerly so prevalent at some of our factories.

Precautions. Pasteurization should begin as soon as possible after the whey reaches the tank to prevent the development of acid, and to take advantage of the temperature of 98 degrees before it begins to cool. Care must be taken that the temperature does not rise above 160 degrees. A higher temperature will precipitate the albumen and cause the whey to be flocculent and slimy. A temperature less than 150 degrees is too low, as the growth of bacteria is not prevented to a sufficient extent. Small or large quantities of whey should not be left over in the tank from day to day, as this whey will eventually become sour, and act as a culture in the new whey, rapidily raising the acidity and nullifying to a great extent the work of pasteurization. The boiler must be large enough to furnish economically the steam required. Inexpensive results cannot be obtained otherwise. The tanks should be as close to the boiler as possible, and the pipes insulated to prevent condensation and waste of steam before it reaches the whey. If live steam is used pressure as high as practical should be carried, and the steam not given too much vent into the tanks or the boiler will rapidly be emptied of water. Heat under steam pressure by keeping the live steam going gradually into the whey as fast as it is generated by the fuel. Beginning with good steam pressure less water will pass over into the whey. It is not wise to attempt to pasteurize unless it can be done properly. It will be a waste of steam and the results disappointing. Pasteurization of whey is for the purpose of getting rid, so far as possible, of the evils of unclean, sour whey, and is not a panacea for the evils of improperly cared for milk.

Cost. The cost will be according to the condition under which the work has to be done, such as size of boiler, location of tanks, whether the exhaust steam from the engine can be utilized, the system followed and experience. It will range from 50 cents to $1 per ton of cheese. Several tests made this year with live steam direct from the boiler under good conditions, allowing $4 per ton for coal, place the cost at 64 cents per ton of cheese. The patrons practically get all the benefits from pasteurization, therefore should pay each their share of the cost.

Different systems of Heating. The whey has to be raised from a temperaature of 98 degrees to 150 or 155 degrees, or about 52 to 57 degrees.

1st. Turn the live steam from the boiler under 60 to 80 pounds pressure directly into the whey, distributing through a simple system of three-quarter inch pipes to get an even temperature, and most economical use of the steam. This is the most effective system, and it does the work satisfactorily, but no doubt the most expensive.

2nd. Turn the exhaust steam from the engine into the tanks, and add sufficient live steam to raise the whey to the required temperature. This system is less expensive, where practical, but perhaps not quite so effective, as it may take longer to heat.

3rd. Turn the exhaust steam from the engine into the pipe leading from the pump or ejector to the upper tank, placing the connection several feet above the pump, turning a small pipe inside the large pump pipe a foot or so long in the direction which the whey is travelling. Add sufficient live steam to get the required temperature. This is still cheaper. Some little difficulty may be found in regulating the temperature at first.

4th. Raise the whey from the lower tank to the upper with an ejector, and add sufficient live steam in the upper tank to finish the heating. The ejector, if large enough, will increase the temperature about 20 degrees while the whey is passing through.

5th. Heat the whey in the lower tank with the exhaust steam from the engine to a temperature of 135 degrees, then raise with an ejector to the upper tanks, when it will be found to be at about 155 degrees, the ejector having supplied the extra 20 degrees. Any small quantities of whey left in the lower tank should also be heated at all times.

6th. Use a special heater, a device consisting of a pipe two feet long, 6 inches in diameter, capped at both ends—the cap drilled and threaded to allow pump and exhaust steam and overflow connections. Set heater upright. Connect exhaust steam to the bottom. Connect whey pipe at the top, also overflow pipe. Whey is heated before it passes out through overflow pipe. If exhaust steam not sufficient add some live steam. May have to be disconnected and cleaned occasionally. Cost about $6 to make. This special heater has been found very economical for pasteurizing skim milk. Should work equally as well for whey.

Experiments were carried on for four months at Kerwood factory *re* the making of whey butter, the results of which will no doubt be dealt with by the Department of Agriculture.

There are 200 cheese factories in the 6 groups and 7 outside factories, making the same total as last year. There are 16,295 patrons producing milk for these 200 factories; 16,287 tons of cheese made in 1907. This would average 81 patrons to the factory; 83 tons of cheese to the factory; 1.02 tons of cheese to the patron.

31 factories in the Simcoe group; 94 patrons to the factory; 92 tons of cheese to the factory; .98 tons of cheese to the patron.

34 factories in the London group; 78 patrons to the factory; 72 tons of cheese to the factory; .88 tons of cheese to the patron.

35 factories in the Listowel group; 86 patrons average to the factory; 67 tons of cheese to the factory; .75 tons of cheese to the patron.

36 factories in the Ingersoll and Woodstock group; 59 patrons to the factory; 110.5 tons of cheese to the factory; 1.89 tons of cheese to the patron.

36 factories in the Stratford group; 86 patrons to the factory; 100 tons of cheese to the factory; 1.1 tons of cheese to the patron.

28 factories in the Brantford group; 124 patrons to the factory; 65 tons of cheese to the factory; .5 tons of cheese to the patron.

REPORTS OF INSTRUCTION IN CHEESE FACTORIES OF WESTERN ONTARIO, 1908.

Group and Instructors	Factories	No. of patrons	No. tons of cheese, 1907	No. visits	No. call visits	No. curd tests made	No. of samples tainted	No. of lacto-meter tests	No. Babcock tests for adulterations	No. patrons visited	No. new cans bought	Average % fat in milk for season	Average % loss of fat in whey for season	Factories pasteurizing whey	Average % acidity of whey pasteurized.	Average % acidity whey not pasteurized	Average % fat in whey pasteurized	Average % fat in whey not pasteurized	Expenditure
Stratford: Alex. McKay	36	3,118	3,600	118	101	510	260	4,340	146	83	514	3.5	.22	11	.38	1.17	.19	.1	$4,476
Ingersoll and Woodstock: E. N. Hart	36	2,105	3,978	121	115	341	211	6,770	343	150	329	3.5	.24	18	.38	1.08	.24	.08	6,576
Simcoe: Geo. Travis	31	2,920	2,860	94	65	68	40	4,556	80	77	333	3.5	.23	8	.31	1.37	.185	.11	3,285
Brantford: R. H. Green	28	2,472	1,743	106	114	94	37	6,882	88	55	339	3.5	.23	6	.36	1.11	.23	.11	3,200
Listowel: J. R. Burgess	35	3,023	2,211	101	80	93	19	6,698	63	49	308	3.5	.22	6	.3	1.09	.21	.08	2,577
London: W. Hamilton	34	2,657	2,435	97	74	27	22	4,978	143	27	349	3.5	.23	6	.25	1.09	.22	.11	3,978
Outside Factories: F. Herns	7	......	......	...	8	......	...	......	...	...	......	...	...	...	...	...	...	...	......
	207	16,295	16,827	637	557	1,133	589	34,224	863	441	2,172	3.5	.23	55	.4	1.15	.22	.09	24,092

The average percentage of fat in the milk for 1908 was 3.5. For May, 3.3; June, 3.37; July, 3.38; August, 3.5; September, 3.65; October, 3.8. The average loss of fat in the whey for season was .25 per cent. For May .226 per cent.; June, .223 per cent.; July, .226 per cent.; August, .236 per cent.; September, .223 per cent.; October, .241 per cent.

There were 637 full day vists, and 549 call visits, making a total of 1,186 visits to the factories; 1,143 curd tests were made, and 549 of these samples were tainted; 441 patrons were visited; 34,224 lactometer tests were made, being 850 less than last year; 863 Babcock tests made for adulteration, or 827 less than last year; 223 samples were found deteriorated—180 on one test, 43 on several tests, or 17 less than last year, showing that the system adopted last year of dealing with cases of adulteration by prosecution is having a marked effect in stamping out adulterated milk. 3,206 Babcock tests made other than for adulteration; 565 Babcock tests made for loss of fat in the whey; 2,272 new milk cans were bought, 584 more than last year; this is rapidly getting rid of old rusty cans. 23 factories are paying by test, 4 more than last year; 13 factories have a cool curing-room, only one more than last year; 19 factories where the whey is fed at the factory; 137 factories have milk testing equipment; 141 makers qualified to test milk; 74 factories repaired; 35 factories adopted the ¼-inch curd knife; 30 factories put in new whey tanks; 19 put in new vats; 10 factories were painted. Numerous other improvements are reported. Total expenditure for improvements, $24,092.

District meetings were held during November and December in the different groups, where many points of interest to the industry were discussed. The majority of these meetings were better attended than last year. Since the last Convention 129 annual meetings of patrons have been attended by the instructors and myself, with an average attendance of 40, reaching about 5,500 patrons. Applications are in for speakers to attend a number of annual meetings during this winter.

43 cases of adulteration of milk were reported by the instructors. These were looked after by the special officer appointed for this work, and fines ranging from $10 to $25 were imposed on the patrons. One case was defended, but the conviction was finally secured. This system of handling cases of adulteration seems to give general satisfaction.

The instructors have all worked hard and have done their best to make the season's work successful. I wish to express my appreciation of the loyalty and kindly feeling which the instructors have shown towards me. The very best of feeling prevails between the instructors, the Board of Directors of the Association, and myself. I also wish to thank the directors and members of the various committees for their hearty co-operation. I wish also to thank the cheese and butter makers, factorymen, and buyers for kindness to me and the pleasant relation existing this year.

I want to say a few words in connection with the pasteurization of whey. The press have helped us out in this matter to a great extent. I had a few figures that it took a considerable time to gather, and I have presented them to you because I believe this subject of the systematic pasteurization of whey is a step in the right direction of improved quality of cheese. (Applause).

CHEESE FACTORIES.

Stratford Group.—Alex. McKay, St. Marys, Instructor.

Factories:—St. Pauls, Thorndale, West Nissouri, Ballymote, Black Creek, Farmer's Union, Blanshard & Nissouri, Oliver, Fullarton, Sebringville, Maple Grove, Avonbank, Blanchard, Kintore, Evelyn, East Nissouri, North Oxford, Thamesford, Bennington, Red Star, West Zorra, Spring Creek, Strathallan, Brooksdale, Innerkip, Eastwood, Soho, Bright, Cassel, Tavistock, Oak Grove, German Union, Devizes, Proof Line, North Branch.

Ingersoll and Woodstock Group.—E. N. Hart, Ingersoll, Instructor.

Factories:—Belmont, Mapleton, Lyons, Springfield, Brownsville, Northwood, Harrietsville, Crampton, Burnside, East and West Oxford, Burgessville, Zenda, New Lawson, Mt. Elgin, Salford, Newark, Norwich Jct., Norwich Gore, New Durham, Harley, Cathcart, Diamond, Vandecar, Sweaburg, Foldens, Prouse, Culloden, Avon, Gore, Verschoyle, Dereham and West Oxford, Virtue, East Oxford, Losee, Brookbank, Westminister.

Simcoe Group.—Geo. Travis, Simcoe, Instructor.

Factories:—Lake View, Vienna, Straffordville, Fairground, Clear Creek, St. Williams, Erie View, Carholme, South Middleton, Springford, New England, North Bayham, Summerville, Delmer, Miller's Corners, Firby, Malahide, Yarmouth Centre, Union, Sparta, Dunboyne, Lyndoch, Walsh, Vittoria, Nixon, Tillsonburg, Windham Centre, Scotland, Kelvin, Bookton, Courtland.

Brantford Group.—R. H. Green, Cayuga, Instructor.

Factories:—Renforth, Alberton, Lynden, Grand River, Caistorville, South Cayuga, Clanbrassil, York, Villa Nova, Cockshutt's Road, Mt. Pleasant, Boston, Hagarsville, Harrington, Forks Road, Attercliffe Station, Canboro', South Grimsby, Woodburn, Bismarck, Excelsior, Lynn Valley, Waterford, Tyrell, Rockford, Caledonia, Jarvis West, *Black Creek.

Listowel Group.—Jas. R. Burgess, Listowel, Instructor.

Factories:—Molesworth, Carthage, *Milverton, Honey Grove, Avondale, Classic, Ellice and Logan, Willow Grove, Monkton, Maitland, Marion Beaver, Silver Corners, Ethel, Newry, Elma and Mornington, Elm Bank, Fordwich, Dominion, Donegal, Trowbridge, Wallace, Wyandotte, Rothsay, Cotswold, Goldstone, Paramount, Ripley, Huron, Pine River, Millarton, Harriston, Conn, Hawkesville, Wellesley.

London Group.—W. Hamilton, Woodstock, Instructor.

Factories:—Maple Leaf, Banner, Dorchester Station, Dorchester Union, Mossley, Gladstone, Thames, Pond Mills, White Oak, Glanworth, Scotsville, Delaware, Mt. Carmel, Strathroy, Watford Union, Warwick, Maple Grove, Ridgetree, Uttoxeter, Galabank, Wyoming, Walnut, Napier, Appin, Payne's Mills, *Muncey Road, Sifton's, *Keyser, *West Magdala, *Inwood, *Kerwood, Crinan, Colinville, *Brigden.

Outside Factories:—Laurel, Jessopville, Conover, Dundalk, Lavender, Vittoria and Avening.

CREAMERIES.

Western and Southern Group.—Fred. Dean, Guelph, Instructor.

Creameries:—Forest, Corbett, Lucan, Vanneck, Medway, Winchelsea, Shamrock, Exeter, Keyser, Kerwood, Lambton, Brigden, Inwood, Glencoe, Muncey Road, Cedar Springs, Elgin, St. George, Princeton, Beachville, King Edward, Point Albino, Welland, Vinemount, Imperial, Cayuga, Union, Brownsville, Strathcona, West Magdala, Wallacetown, Ridgetown, Dresden, Merlin, Maple Leaf, Farmer's Friend No. 1, Farmer's Friend No. 2, Maple City, Sleightholm's, Black Creek.

Eastern and Northern Group, Mack Robertson, St. Marys, Instructor.

Creameries:—St. Marys, Nelson, Palermo, Halton, New Dundee, Nithside, Silver Springs, St. Jacobs, Stratford, Whirl Creek, Winthrop, Holmesville, Dungannon, Bluevale, Whitechurch, Brussels, Egremont, Star, Bervie, Climax, Underwood, Paisley, Walkerton, Ayton, Chesley, Tara, Wiarton, Pleasant View, Neustadt, Alsfeldt, Milverton, Grand Valley, Credit Valley, Fergus, Beaver Valley, Whittington.

*Combined butter and cheese.

THE CARE OF MILK FOR CHEESEMAKING.

By George H. Barr, Dairy Division, Ottawa.

I would like to congratulate the Dairymen of Western Ontario on several things. I had an opportunity of seeing a number of the prize cheese yesterday, and I must say they are exceptionally fine and exceptionally uniform in quality. There is no use in making only a few good cheese, and I am glad to know you are continuing the good work, and making a number of fine quality. One point of interest to me is the fact that the trophy has gone to a district which never had it before. There are some lessons to be drawn from that. I had an opportunity of visiting Mr. Donnelly's factory three or four years ago, and my impression was at that time that if that man ever struck the right track he would make some of the fellows in this country sit up. The reason I had this impression was because everything about that factory was scrupulously clean, and the cheese were the best finished I saw in Western Ontario that year, barring none. He has got to go fast to keep that trophy. I would like to see it go to the Brantford section. The Northern fellows have had this business for a long time. I believe it is up to the men in the Eastern Districts to do the best work they know how, in order to win that trophy. I heard something about western creamery butter last year that made me warm, because I do not like to hear Western Ontario run down. One of our Montreal exporters said something that was anything but complimentary, that the Western Ontario creamery butter was not as good as it used to be. Four years ago I had hopes that Western Ontario butter would take a good standing, and as far as I have been able to learn the reason you are not progressing as you should is when the patrons commenced to give you better cream then the manufacturers started gatherng fewer times, and that is not right. I believe the manufacturers are making a mistake, and I hope you will think of that, and make more trips for the cream. You must get the flavor, and that is something you have not got.

Although this question of the care of milk for cheesemaking is an old topic, and one which has been discussed in the press and at dairy meetings probably more frequently than any other, it is still a subject in which all dairymen should be deeply interested, for the very foundation of successful cheesemaking lies in the production of clean, sweet milk.

It is the general opinion that milk for cheesemaking should be "aired" in some manner after it is drawn from the cow, and for many years patrons of cheese factories were advised to use some special style of aerator, or expose the milk to the air by dipping it.

A few years ago Prof. Dean reported some experiments on this subject. His conclusions were that there was no advantage in aerating milk for cheesemaking. Many dairymen at that time thought such a statement almost rank heresy, and that his College experiments were scarcely applicable to factory conditions; but there has been a growing conviction in the minds of dairymen that aeration is of little value.

In order to throw some further light on this important, if somewhat threadbare subject, Mr. Ruddick decided to have some experiments conducted last summer under factory conditions.

It was my privilege to carry out this interesting and instructive work, with the able assistance of Mr. J. G. Bouchard, also of the dairy staff. Our object was not to secure information from a bacteriological standpoint, but rather to discover what effect different methods of handling the milk at the farms would have on the quality of the curd and cheese.

The principal points we had in view were, to ascertain the advantages or disadvantages of aerating, of cooling and aerating, and of cooling the milk without aeration under ordinary farm conditions, and if possible, discover a simple, convenient, inexpensive and effective method of treating the milk, so that it might be delivered at our cheese factories in such a condition that our cheesemakers would not have to contend with gassy and other undesirable fermentations during the process of manufacture, or suffer losses from unclean flavors in the cheese.

We made a very convenient arrangement with Mr. John McEwan, proprietor of the Rideau Queen cheese factory, Smith's Falls, whereby we had the use of his creamery room for the season, and also a number of his patrons were willing to allow us the privilege of going to their farms to arrange for the care of their milk. At first we thought of taking the milk from six or eight patrons, but we found it would be difficult to get all the details in connection with the treatment the milk received at the farm from so many, and finally decided to use the milk from two patrons, Mr. Walter Hyslop and Mr. D. Condie. These two gentlemen had the largest herds convenient to the factory, and also had ice stored for summer use. Mr. Condie's farm lies on the west and Mr. Hyslop's on the south side of the town of Smith's Falls. Part of Mr. Condie's farm consists of drowned land from the Rideau Canal, and the cows pastured a good part of the summer on the flats around this swampy section. Mr. Hyslop's farm had some low land as well as high and stony soil. One could scarcely call either farm ideal pasture land for the most delicate flavored milk, but we were very glad to have these conditions, thus giving an opportunity to see results from what may be considered about average farm lands.

Mr. Condie's herd of 17 cows consisted of eight grade Ayrshires, four grade Holsteins, and five grade Shorthorns. Several of these cows had aborted during the winter, but were milking fairly well all season. One cow had been milking over a year.

Mr. Hyslop's herd of 18 cows consisted of one pure-bred Holstein, two grade Holsteins, and fifteen grade Ayrshires. A number of his cows had also aborted during the winter. These cows were fed silage for several weeks in July, which kept up the flow of milk well, with no detrimental effect on the milk for cheesemaking.

The cows were always milked in the stable at both places.

Mr. Hyslop's stable was frame and Mr. Condie's a stone basement under the barn. Both had wooden floors, which could not be considered by any means as sanitary as cement. The walls, ceilings and floors were dusty.

The milking was done at Mr. Hyslop's by his four sons, and at Mr. Condie's by himself and two hired men.

At both places, bright tin pails were used to milk in. No special regulations were asked for in regard to milking, or feeding the cows, our object being to take the milk as they gave it to us, and see what result different treatment at the farm would have on it when manufacturing it into cheese.

The milk was delivered to the factory in the usual way, each patron delivering his own milk. Mr. Hyslop usually came to the factory about seven o'clock, and Mr. Condie about eight o'clock each morning, which gave us ordinary factory conditions for delivery.

The equipment used at each farm consisted of two Champion aerators, a box dividing the milk equally in the cans, a shotgun can for ice and water, a dipper, a thermometer, and two half barrels for setting the milk cans in cold water.

Only the evening's milk was treated. The morning's milk was not aerated or cooled.

Mr. Bouchard and myself were always present at the farms when milking commenced in the evening to take charge of the milk as soon as it was drawn from the cow. At Mr. Condie's as the cows were milked, the milk was strained into shotgun cans sitting behind the cows, and then carried to the milkstand. At Mr. Hyslop's the milk was poured into a strainer pail in the stable, and carried to the milkstand and strained into the milk cans.

The milk was divided by pouring it into a square tin box placed on top of the aerators or milk cans. An outlet at each end of this box allowed the milk to flow quite accurately into the two milk cans marked A and B. The morning's milk when mixed with the evening's at the farm was divided in the same manner. The different lots were treated as nearly alike as possible at both farms. At the factory, two small vats were used, the A lots of the evening's milk from each farm being put into vat A, and B lots into vat B. The morning's milk was divided equally into each vat.

Curd tests were made of each can of evening's milk and also of the morning's milk. Babcock tests were made of the milk in each vat after it was received, and during the whole season only four times was there any difference in the per cent. of fat, showing that the different methods of handling the milk had not much effect upon the per cent. of fat. The per cent. of fat in the milk from the two herds was practically the same.

The per cent. of acid was determined in each lot of evening's and morning's milk by the Acidimeter or Alkaline test.

Milk from the Hyslop farm nearly always showed a higher acidity than that from the Condie farm.

The average tests for the season were as follows:

	Evening's Milk.		Mixed Milk.		Morning's Milk.
	A	B	A	B	
Hyslop	.169	.174	.170	.171	.165
Condie	.160	.162	.166	.168	.160

When the milk was cooled in the evening and the morning's milk delivered in separate cans, ½ of one per cent. starter was added as soon as the first milk was received (about seven o'clock) and often the milk would not set until about ten o'clock.

We had to use a starter all the time, in order to get the curds in condition to leave them and go out to the farms to look after the milk in the evening, and in many cases, its use gave better conditions in the curds from gassy milk, than if no starter had been used.

No effort was made to do experimental work regarding methods of manufacture. All the curds were handled carefully, as nearly alike as possible, and according to the best methods in practice in our cheese factories.

The cheese were kept in the factory curing room from 12 to 15 days, then shipped to the Ottawa Cold Storage. The average temperatures in the curing room were in June 71, July 72, and August 68 degrees. The cheese were scored for flavor just before being shipped and again on September 21st in the cold storage.

Although we have considerable information relating to the number of pounds of milk required to make a pound of cheese in the different experiments, we feel it is scarcely reliable on account of the small quantities of milk used.

Flavors in the milk, and flavor and texture in the curds and cheese, may be secured equally as well from small quantities as from large, but to get reliable results in regard to the losses in manufacturing, we believe it is necessary to do the work in the large factory vats. This we hope to do another year.

Location of the milk stands where the milk was aerated and cooled. Lantern slides were here used to illustrate the utensils used at the farm and the position of the milkstands. The first slide showed Mr. Hyslop's milk-stand. To the right is the corner of the barn, the cow stable being nearer the stand at the end of this barn. This stand is 60 feet from the cow stable door, and the space between is in grass and fairly free from manure or dust. On the other side of the stand is the orchard and backyard of the house. The barnyard is on the opposite side of the stable. All the manure was hauled out early in the season. Fault may be found with the location of this stand. It is probably a little too close to the stable, and the buildings and orchard prevent getting the full benefit of the wind from all directions; yet it is better situated than hundreds of milk stands through the country. Everything around it was kept clean and tidy. Notwithstanding the apparent favorable location of this stand, 38 per cent. of the curd tests from milk dipped or run over an aerator here, were gassy and not clean in flavor.

The second slide showed the milkstand at Mr. Condie's. It is at the end of the woodshed, in the corner of which is stored the ice. A roadway runs between it and the house, the horse stable is about 40 feet distant, directly in front of the stand, and the barnyard and cow stable on the other side of this, about 136 feet from the stand. A hogpen is situated 88 feet from the stand, a short distance from the other end of the woodshed. This stand may be considered in a good location, as there is good circulation of air and not much dust surrounding it, yet 61 per cent. of the curd tests from milk dipped, or run over aerators here were gassy and not clean in flavor.

The third slide showed a splendid gas producing situation, the waggon standing in the barnyard not far from the hogpen door. Milk exposed to the air or left open all night here, never failed to give gassy and floating curds in the curd test, as well as gassy flavors and gas holes in the curds.

The fourth slide showed the method of cooling the milk without aeration at the Hyslop farm. The tub seen here is part of a gasoline barrel which cost $1.25 and made a tub for each farm. Our custom was to fill this tub with water from the well before milking commenced, and set the milk can in it, and as the cows were milked, the milk was strained into the can. We found that 180 to 200 lbs. of water was all that was necessary to cool one-half of the milk from 18 cows. This milk was not stirred or dipped. The only agitation it received was to stir it with the thermometer to get the temperature, and as soon as milking was finished, the cover was put on the can and left sitting in the water all night. The water used came from the well at 46 degrees temperature. The average temperature of the water in the tub when we left it (about five minutes after the milking was finished) was 59.6 degrees and the milk at the same time was 77.3 degrees. The average temperature at the factory the following morning was 66.5 degrees, and only 6.6 per cent. of the curd tests from milk so treated on this stand were slightly gassy and not quite clean in flavor.

The fifth slide showed where the milk was cooled by setting the milk can in a tub of water at Mr. Condie's. This platform is in the corner of the barnyard, a corner of the horse stable is seen to the right. The cow stable is directly in front of this trough, about 96 feet distant. All around this

trough is bare ground, where the cows often stood both before and after milking, and in dry weather it was very dusty. The manure pile from the horse stable is about 52 feet from this platform.

The pump is situated behind the horse stable, 93 feet from the trough, and the water piped under ground to the trough. A gas pipe was put into the upright pumplog to carry the water to the tub at the end of the trough, and a spout put from the tub into the trough. All the water pumped for the stock had to pass through this tub, flowing out at the top into the trough. By this arrangement, not five minutes were required to take care of the milk, for when enough water was pumped to water the cows, the milk was cooled enough to leave as soon as the milking was finished.

This milk was not aerated in any way. The cover was put on the can as soon as milking was finished. The temperature of the milk and water was practically the same as at the other farm, and the curd tests from this milk showed the same results also, only 6.6 per cent. were slightly gassy and not quite clean in flavor.

The curd tests from the milk aerated by dipping or running over an aerator at this platform gave 71 per cent. gassy and not clean in flavor, some of them floaters.

We did not go to very much expense in arranging to cool the milk as I have stated, but the results were so sastisfactory that I would strongly recommend patrons of cheese factories who have a good water supply to construct such a tank as shown on the screen. It should be placed between the pump or water supply and the watering trough, and all the water used for watering the stock would pass through this tank and cool the milk while doing so. The important point to observe in connection with such a tank is, the overflow must be at or near the top of the tank, so that the water which is warmed by the milk may overflow into the watering trough. The warmer water is always at the top in a tank. Such an arrangement will practically guarantee sweet, clean flavored milk, with a little or no time spent on it, which is quite a consideration during the busy summer months on the farm. When ice is used, the water in the tank should not be changed as it would only waste ice.

A number of illustrations were given showing the condition of the curd tests and curds, from milk aerated, and aerated and cooled, compared with curds from the same milk cooled without aeration. They all showed that the milk exposed to the air gave curds full of gassy openings, while those from milk cooled with as little exposure to the air as possible were free from gas.

Tables were also shown which gave the percentage of defects in the curds and cheese in the different groups of experiments as follows:

Milk aerated by dipping with a dipper:

Curd tests not clean in flavor	83.4 per cent.
Curd tests gassy in texture	77.8 per cent.
Curds in the vats not clean in flavor	88.9 per cent.
Curds in the vats gassy in texture	77.8 per cent.
Cheese not clean in flavor	77.8 per cent.

Milk run over a Champion Aerator:

Curd tests not clean in flavor	68.2 per cent.
Curd tests gassy in texture	68.2 per cent.
Curds in the vats not clean in flavor	50 per cent.
Curds in the vats gassy in texture	50 per cent.
Cheese not clean in flavor	75 per cent.

Percentage of defects in total lots (21) aerated without cooling:

Curd tests not clean in flavor	75 per cent.
Curd tests gassy in texture	72 per cent.
Curds in the vats not clean in flavor	66.6 per cent.
Curds in the vats gassy in texture	61.9 per cent.
Cheese not clean in flavor	76.1 per cent.

Milk cooled by setting a shot-gun can of cold water, or water and ice in it. No aeration.

Curd tests not clean in flavor	10 per cent.
Curd tests gassy in texture	20 per cent.
Curds in the vats not clean in flavor	...
Curds in the vats gassy in texture	...
Cheese not clean in flavor	20 per cent.

Milk cooled by setting milk cans in a tub of cold water. No aeration.

Curd tests not clean in flavor	6.6 per cent.
Curd tests gassy in texture	6.6 per cent.
Curds in the vats not clean in flavor	...
Curds in the vats gassy in texture	...
Cheese not clean in flavor	13.3 per cent.

Percentage of defects in total lots (20) cooled without aeration.

Curd tests not clean in flavor	8.3 per cent.
Curd tests gassy in texture	13.3 per cent.
Curds in the vats not clean in flavor	...
Curds in the vats gassy in texture	...
Cheese not clean in flavor	15 per cent.

Milk cooled and aerated:

Curd tests not clean in flavor	44 per cent.
Curd tests gassy in texture	44 per cent.
Curds in the vats not clean in flavor	40 per cent.
Curds in the vats gassy in texture	20 per cent.
Cheese not clean in flavor	60 per cent.

It will be readily seen from the above figures that by far the best results were obtained from milk cooled by setting the milk cans in water and putting the covers on the cans immediately after milking was finished. This particular method of treating the milk was carried on during the very hottest weather in July and August last, and the milk arrived at the factory in practically the same condition every morning, sweet and clean in flavor. If all milk for cheesemaking was handled in this manner, and the milk cans and pails kept perfectly clean, I believe we would practically do away with all gassy curds. The cheesemakers would have shorter hours, they would make more cheese per hundred pounds of milk, and have very few, if any, bad flavored cheese.

Mr. Paget: Did you say 66½ was cool enough?

Mr. Barr: I wish I had something more definite on that point, but I want to say that our experience was from the small quantity we were handling, that we got that milk in too sweet to make cheese, and I will go this far and say that if you get the evening's milk at the factory cooled to 70 degrees it would be all right.

A Member: Would lower than 66 be too cool?

Mr. Barr: Everybody knows you cannot get through your day's work too early, and I have always felt that if any man loses half an hour in the morning it is wasted time. I believe you can get better cheese if you have the milk set half an hour or fifteen minutes after it is in, and I believe the milk should be delivered at the factory at about 70 degrees.

MR. STEINHOFF: I would like to draw attention to one point Mr. Barr mentioned in his opening remarks regarding the quality of creamery butter in Western Ontario. That statement coming out from an authority like Mr. Barr makes it quite a serious thing for the men who are interested in western creamery butter. If Mr. Barr saw the butter from the best creameries in Western Ontario, I would accept his statement, but inasmuch as that statement comes from a dealer in Montreal, I think it changes the situation, and I think an explanation should be made.

The situation has changed since Mr. Barr left Western Ontario. The highest prices have been obtained for butter in Western Ontario, and the products of our best creameries has not been going to Montreal. The butter that goes to Montreal is from the inferior creameries. Last summer we sold about 2,000 boxes in Montreal and 6,000 boxes in Western Ontario. The quality of western butter has been found better than eastern butter. The butter from Eastern Ontario is inclined to go flat. I am simply saying this in justice to the best creameries in Western Ontario.

ADDRESS.

BY G. A. PUTNAM, DIRECTOR OF DAIRY INSTRUCTION.

As it is within a few moments of the time for adjournment for this session, my remarks will necessarily be brief. I wish first to compliment this audience upon the close attention which has been paid to the addresses delivered and the papers read since this Convention began. It is encouraging to those who are officially connected with dairy work in the Province to note this evidence of increased interest. The questions which have been asked, the discussions and the comments at this Convention—all indicate that the dairymen are giving closer attention and study to this industry which is not of local importance only, but a national question, and all who are connected with it in any way should feel proud of the standard which has been set and the progress which is being made from year to year.

We hear from the exporters, the Chief Instructors, the instructors in charge of the various syndicates, proprietors of factories, makers, and patrons, encouraging reports regarding the instruction work of the past year. The Department of Agriculture which finances and directs this work, is gratified with these expressions of appreciation, and considers that the large expenditure of funds is quite justified by the good accomplished and the appreciation shown. No doubt there are some weaknesses yet to be overcome, and there is certainly much yet to be accomplished.

Both Mr. Publow and Mr. Herns, Chief Instructors for Eastern and Western Ontario respectively, express themselves as very much pleased with the progress along dairy lines throughout the Province during the past season. Mr. Publow informs us that the progress in Eastern Ontario during 1908, has been more marked than in any previous year, and he believes that the results following the efforts of the past season will compare favorably with the advance made in any two previous years. This speaks well for the future success of dairying in Ontario. The factories in Eastern Ontario are being fixed up as fast as the resources of the proprietors and the increase in volume of business will permit, and the farmers are taking better care of their milk

and feeding and caring for their cows in a better manner. All this indicates the interest and faith which the dairymen of the east have in their industry, and augurs well for the future.

Up to the present we have been building a foundation, trying to establish a solid foundation upon which to work. I think our foundation is now fairly secure and we are in a position to go on to greater things. Even though we have accomplished a good deal for the maker, proprietor and the producer, there is still much to be desired so far as all and each of these are concerned. I consider, however, that in some respects, we have not much more than made a start in dairy methods in this Province. I refer chiefly to the sanitary production of milk. This is a feature of the work which is certain to receive increased attention as the years advance. And the ultimate success or failure of the industry will depend largely upon the degree to which cleanliness is observed in all branches of the work.

You will remember that it was only two years ago that we were able, through a change of system of instruction and the increased funds voted by the Legislature, to include every creamery and factory in the Province in our system of instruction, and it was only after we got that method that we were able to establish that uniformity which is essential in the successful production and marketing of the products of the farm, and especially true of dairy products. If one poor lot of cheese and ten lots of superior quality are sent to the same market, the consumers are inclined to judge future shipments from the same place, not by the ten good lots received, but by the one inferior sample. The consumers show a tendency to remember most distinctly that which has not pleased, rather than that which suited their fancy. It is very essential then that we endeavor not only to maintain a high standard but also to secure uniformity, for we are judged by the poorest goods that we export. It is not just that one factory should be allowed to injure the good reputation of Canadian cheese, when fifty other factories are spending money and effort in an endeavor to maintain quality. And when we come to the patrons, we are surprised that men, who are spending money and devoting time every day, giving extra care to their milk according to approved sanitary methods, will allow one or two patrons who are indifferent as to the care which they take in the producing and handling of their milk, to lessen the value of the total output of the factory. This is unjust, and the remedy is largely in the hands of the people.

We have legislation now by which we are able to control the sanitary conditions not only upon the premises of the producers but also at the factory, and with a proper exercise of the power given by the Legislature, we should be able to go on to better things. We have a very good foundation upon which to work. It may be, however, that there are one or two stones yet to be put into this foundation. In Eastern Ontario especially, we have too many factories and in Western Ontario in certain sections, we are going to have too many factories in the near future unless we bestir ourselves. It remains with the factorymen of this Province as well as the producers and all others connected with the industry to see that the erection of new factories is regulated in some way. I am sorry that I cannot lay before you some definite plan whereby those who propose the erection of a factory within the territory now being served by other factories which are well equipped, might be prevented from putting up a competing factory of small capacity, in which they cannot afford to pay the maker a sufficient sum of money to make it a paying business for him in which there is little or no prospect of making any interest on the investment. This is a problem which I trust you will consider, and it may be that legislation will be necessary; but governments do not usually undertake to legislate to regulate such matters, unless

they are asked and urged to do so. The elimination of the unnecessary small factories already established, and the control of the building of factories is a matter that must be dealt with in the near future. I merely throw out the suggestion to you.

NOTE.—The speaker here made brief mention of the results of experiments in the manufacture of whey butter under factory conditions in both Eastern and Western Ontario. Full report of these experiments appear in the Appendix to this report.

Mr. Putnam continued:

It will not pay any factory to make whey butter unless it is receiving a very large quantity of milk. One of the most important considerations is that it puts a premium on carelessness on the part of the maker and would thus tend to lower the quality of our cheese. If any of the factory men here contemplate the manufacture of whey butter, I would advise that they study very carefully the results of the experiments conducted in Eastern and Western Ontario last season, before taking action in the matter.

We took a census last summer of the average production of the cows of Eastern Ontario, and in some syndicates comprising as many as forty factories we found that the average production of each cow was not more than 2,500 pounds for the factory season, and two or three groups went even below this. What does this mean? It means not only that a great many of these cows were being kept at a direct loss, but that the average of the cows little more than paid for keep.

It is a reflection upon the farmers to feed cows the way some are fed during the hot dry months of the summer and early fall. The great majority of farmers, even yet, neglect to provide suitable food for these months, although there is a growing tendency on the part of the dairymen to make provision for the proper soiling of their cows during the summer. It is unfair to the cow to test her unless you give her a fair amount of food; and on the other hand there are, I think, a number of cows which would be ashamed to accept the food provided for them, could they read the records of their production for the season.

Might I refer again to the sanitary production and care of milk upon the farm for factory and creamery purposes? We occasionally see articles and illustrations descriptive of the great care taken by dairymen who are supplying certified milk for consumption in the cities, and I am convinced that the cost of such equipment and the large expense to which the proprietors are put for maintenance and labor tends to discourage rather than encourage the average farmer to improve his equipment and methods. He realizes that he cannot erect stables and instal equipment upon any such lines as the majority of those who are producing certified milk have adopted, and the result is that he does not make any effort at all towards improving the conditions surrounding the production of milk upon his farm.

The proprietors of a farm supplying certified milk for New York City wash their cows and spray them, comb them and house them in well ventilated stables that are washed regularly from top to bottom and are kept scrupulously clean in every respect at all times. Just before milking the cows at this dairy, the air of the whole building is treated with a fine spray which is allowed to settle, thus taking all dust from the air. The helpers are never allowed to wear the same suit twice and they take a bath two or three times a day.

We certainly have a long way to travel in Ontario before we reach any such perfection as this. And I make mention of this equipment merely to impress the fact that there is no necessity for dairymen who are furnishing milk to cheese factories to instal any such equipment or follow like methods.

We find in some of the cities of Ontario that there is great agitation, especially on the part of the medical people, for a better supply of milk. If we get legislation enacted which will require the farmers to meet such conditions as some of the medical men are asking for, two-thirds of the farmers will at once dispose of their herds and go out of the dairying business. In anything of this kind you must be content with gradual progress. You cannot jump from the methods of to-day to perfection in a few weeks nor yet in one or two years.

What we want to-day is not that good farmers shall take better care of their milk, but that those who are not taking good care of their milk shall be influenced in some way to adopt approved methods. Mr. Barr has made it clear to us that we can take sufficient care of the milk without even a supply of ice on the farm; all that is necessary is to use the coolest water we have at hand. We do not require the farmers to wear white suits but we do ask them not to search out their dirtiest suits when they go to milk. We have been reading of model stables for cows, and these are all very well and good in their place; but what we want is that the farmers will take proper care of the stables which they have at the present time. Clean out the stables that you have. Do not wait until you are able to put up a model barn, but clean up that which you have. The success of the industry is going to depend upon gradual growth and improvement. We are making progress, and if we all work unitedly in this matter of clean milk I think our success is practically assured.

It is our intention during the coming season to pay more and more attention to the patrons, and see that they are given more instruction in the matter of producing and taking care of the milk. The Department, I assure you, is going to do its best for the development of this great industry, and we are asking the farmers to give us intelligent and earnest support.

DAIRYING IN SASKATCHEWAN.

BY W. A. WILSON, SASKATCHEWAN DAIRY COMMISSIONER, REGINA.

This is the first opportunity I have had of appearing before an audience in Western Ontario, and I can assure you it affords me a great deal of pleasure to be with you at this time. When it was suggested that I should come here for the purpose of attending both conventions in Ontario, there was no hesitation on my part in accepting. We were told last night that we heard too much of the West and not enough of Ontario. Now we have no argument with you in that respect, but I can only say, that although you have heard a great deal of the West in the past you are going to hear more of it in the future; and any one who has an opportunity of visiting the West, will find that the energy and the ability that has been put into the work out there is bound to be followed by results, and the West is bound to be known throughout the length and breadth of the land. (Applause.) We extend a very cordial invitation to any one who may be travelling through our Province to step off at Regina and look us up at the Department of Agriculture, and you will find we are men like yourselves and willing to give you all the information and help that we can.

We are profiting to a large extent by your experience in the East. We consider that at the present time we stand where you stood thirty years ago. We are the infant dairy Province of the Dominion. Our legislation deals

with creamery work only. We have no cheese factories, nor will we have them for the next fifteen years. There were a few cheese factories in the Province at one time, the last one was in the year 1900, and that closed down because the hauling of the milk cost the farmer exactly $14.50 a ton.

We are also benefited by the experience of the States to the south of us. Ten years ago there were 994 creameries in the State of Iowa; at the present time there are only something over 500; almost 500 of them closed in ten years. Seventy per cent. of the butter was manufactured in 35 of these creameries, which goes to show there were a great many small creameries in the State, and it is said that in the next ten years that probably 50 per cent. of the now existing creameries will be closed. That is a condition similar to Ontario, because there are many cheese factories and creameries in the Province that are standing examples of mismanagement, over-competition, and many other things I might mention. There are buildings also that should never have been erected. The success of any business is largely determined by the conditions in which they were started, and having that in mind we are endeavoring since Provincial autonomy was granted to pass legislation which would give us control of the work in order that we might lay a good foundation and conduct the work in a proper way. To make the work successful you must satisfy the farmer, and at the present time we are discouraging small factories and we are endeavoring to have manufactured as large a quantity as possible in one creamery. Legislation was passed in 1906, whereby no company or association that contemplated the erecting of a creamery in the Province could build until their plans and specifications were inspected by the Deparment. The Department will send out plans free of charge to any one. The object of that is to prevent the erection of unsuitable buildings in which it would be inconvenient to make butter. We are looking twenty years ahead, and endeavoring to avoid that condition which you are now under. Another condition is that no building can be erected until the site and location has been approved by an officer of the Department. That is to guard against unsanitary conditions. Another condition deals with the location with respect to the distance from other creameries, and the creameries are operated on the cream-gathering plan, and no factory can be erected within twenty miles of another one without special permission. The Government also made provision for assisting creameries by way of loans, and a loan to amount of $1,200 is given at the rate of 3 per cent. It is re-payable in 5 years and secured by a first mortgage on the property. Each farmer must sign a form stating how many cows he will keep, and how much milk he is likely to send for six months, and unless 400 cows are promised we will not consider the application. By giving them this assistance, and offering them all the adivce we can, we keep in very close touch with the work. In 1907, the number of applications received was 37, and only one creamery was built. In order to promote centralization we offer to pay the express charges on all creameries established. That means that the farmer living close to the line of railway or 100 miles away is exactly on the same footing We adopt the system of weeding out the poor buttermakers, and the makers are engaged on the percentage basis. Last year we paid one man $190 a month for four months. This year we are paying a salary of $125 and guaranteeing six months' work. Another advantage in connection with centralization is the reducing the cost, and paying a larger price to the patrons.

We have also inserted a clause in our Act that any stockholder of a creamery who is not a patron could not receive more than 5 per cent. on his money. We are endeavoring to promote dairying in the districts where the land is adapted to mixed farming, and we are trying to establish the industry on a permanent basis.

INSTRUCTION AT CREAMERIES, 1908.

BY FRANK HERNS, CHIEF INSTRUCTOR FOR WESTON AND LONDON.

There were in operation this year 77 creameries, or 4 more than last year; 9 of these made both cheese and butter; 14,145 patrons sent milk and cream to these creameries, or only 2,150 patrons less than are sending milk to the 217 cheese factories. This makes a total of 30,440 patrons engaged in producing milk and cream for the factories of Western Ontario.

In 1907, there was produced in Western Ontario, 2,932 tons of butter; in 1908, 3,270 tons, a gain of 338 tons. There were 184 patrons average to the creamery, 45 tons of butter average to the creamery, 462 lbs. of butter average to the patron. This does not include the dairy butter made or the milk and cream supplied to the different cities.

218 full day visits and 93 call visits were made, making a total of 311 visits; 405 patrons were visited, 248 more than last year; 68 creameries are cream gathered, 9 both cream gathered and separator. There are no entirely whole milk creameries in operation. 65 creameries are paying by the Babcock test, 6 more than last year; only 12 creameries are now paying by the oil test, and it is to be hoped this system of paying patrons will soon be entirely a method of the past. 7 creameries are using the scale for sampling cream for testing, 3 more than last year. 72 creameries are using the combined churn; the box churn has practically gone out of use. 14 creameries are using a pasteurizer, 7 more than last year. 13 creameries are using large cans for collecting cream, 12 are using individual cans, 6 are using jacketed cans, 15 are using ordinary cans, and only 18 are now using cream tanks. 38 creameries have first-class cream haulers, 36 only have fair class haulers, 16 of which have a very poor class of cream haulers. The cream hauler has a wide influence among the patrons, since on him depends, to some extent at least, the responsibility of getting the patrons to handle the cream in better condition, and he should be well informed on creamery conditions, and other practical points in order to give the patrons necessary information for improving the quality of the cream. 25 creameries are using a cooler. 49.1 degrees was the average temperature of the storages. This is far too high, and some effort should be made to maintain a lower temperature; butter soon loses its fine flavor if allowed to stand even for a short time at high temperature. 27 creameries kept the butter milk tanks clean, 22 in fair condition, and 21 in very bad condition; an effort should be made to keep these tanks clean as far as posible. The average amount of fat in the cream was 22 per cent.; for the Northern Creameries, 20 per cent., for the Southern creameries 24 per cent.

More uniform methods should be adopted by the creamery men. It would be well to cut out measuring the cream in inches and adopt the plan of weighing. Decide on a uniform system of paying patrons with butter fat or pounds of butter. Do away with the oil test, and all adopt the Babcock test. Have a system as nearly alike as possible in charges for manufacture. Then the patrons would know that every creamery was trying to do a good straight business.

648 tests were made by the beaker method for moisture in the butter, the average per cent. of moisture for the season was 14.33 per cent. There were 61 samples with over 16 per cent. of moisture; these 61 samples, however, came from 19 creameries, 6 in the Northern group, and 13 in the Southern group.

Further improvements are reported in the quality of the cream, in the quality of the butter, and in the general equipment of the factory. The total amount of money expended in creamery improvements was $8,240.00. I wish to also thank the creamery men and instructors for their kindenss to me. The instructors have worked hard to improve the quality of the butter, and did everything they could to make the season a success.

CREAMERY INSTRUCTION, 1908.

——	Western and Southern.	Eastern and Northern.	Total.
	Fred Dean, Instructor.	Mack Robertson, Instructor.	
Creameries	42	35	77
No. of patrons sending cream	6,608	7,537	14,145
Tons butter made, 1907	1,474	1,458	2,932
Tons butter made, 1908	1,743	1,536	3,270
Gain in tons, 1908	260	78	338
Average No. patrons to creamery	157	212	184
" tons of butter "	....	....	45
Average lbs. butter to patron	....	....	460
Full day visits	119	99	218
Call visits	49	44	93
Patrons visited	305	100	405
Average % fat in cream	24	20	22
No. tests made for moisture	474	174	648
Average % moisture	14.32	14.35	14.33
Samples showing over 16% moisture	47	14	61
No. Creameries cream gathered	35	33	68
" " both C. G. & S	8	1	9
" " using Babcock Test	40	25	65
" " " Oil Test	2	10	12
" " " box churn	2	3	5
" " " combined churn	39	33	72
" " " scale for sample	3	4	7
" " " large cans, C. C.	15	13	28
" " " jacketed cans, C. C.	6	....	6
" " " individual cans, C. C.	12	4	16
" " " cream tanks, C. C.	....	18	18
" " first class storage	15	14	29
" " fair storage	22	6	28
" " poor storage	2	11	13
" " no storage	2	....	2
Average temperature of storage	52°	46.2°	49.1°
No. of Creameries good water supply	31	31	62
" " fair water supply	10	5	15
" " good drainage	29	29	58
" " fair "	8	4	12
" " poor "	5	2	7
" " using culture	9	....	9
" " " cooler	14	11	25
Expenditure	$5,820	$2,420	$8,240

REPORT OF NOMINATING COMMITTEE.

The report of the Nominating Committee was received and adopted. The list of officers elected appears upon page 6.

FOOD PRESERVATIVES.

BY PROF. R. HARCOURT, O.A.C., GULPH.

Wherever the conditions favoring the decay of food products exist, methods of preservation always have been and always will be an important question. Before the dawn of the Christian era, man salted, smoked or dried meat that he might preserve it for future use. The reason why dried meat, dried fruits, dried fodders, or salted and smoked meat, or heated and sealed materials did not decay may not have been understood, but the fact remains that these methods of treatment have been practised for thousands of years, and that they are still our most common and best methods of preserving foods to-day.

With the development of the science of bacteriology it has been made plain that the decay of food is due to organized and unorganized ferments, and that anything that will destroy or retard the action of these ferments will prolong the commercial life of the food substance. Further, the bacteriologist tells us that floating in the air around us everywhere there are innumerable germs of decay, putrefaction, and disease, which are only waiting for a favorable place for development.

Some of the conditions most favorable for rapid development of these organisms are, a suitable temperature; at between 70 degrees and 105 degrees F., they are most active; plenty of moisture; and an abundance of suitable food. A high temperature will destroy practicaly all of these germs. *Hence, submitting food to the full temperature of boiling water is one* of the most efficient methods of disinfection, and foods so treated and sealed to exclude air, will keep for a very long time. This is the method commonly practised in canning meat, fruit, and vegetables. On the other hand, a low temperature is unsuitable for the development of germ life. It does not destroy the life; it simply retards the action of the ferments. Consequently, the use of low temperatures, as cold storage, cannot be used to preserve food indefinitely, but rather as a means of keeping food temporarily. Thus it is that meat, fruit, and vegetables may be kept for some time in good condition in cold storage, that cheese ripens slower at the lower temperature, and that milk keeps sweet longer when well cooled.

Moisture is another essential to the development of germ life, and it is for this reason that when the greater part of the water is removed from a food it will keep longer. A moment's reflection will show how extensively this method of preserving food is used. The fodder for cattle is dried, meat and fruit are dried, and flour, in fact all cereal meals, soon spoil if too moist. Advantage is even taken of this principle to preserve milk, by removing moisture in making condensed milk and milk powders; etc. But many of our foods would be rendered undesirable if they had to be boiled or dried to preserve them. Salting and smoking would be equally undesirable, and cold storage is not always available. Hence there appeared to be need for some other means of preserving foods.

Consequently, with the development of our knowledge of the requirements of the various ferments in foods and the disease germs that may get into them, chemistry has made known the existence of many new compounds capable of either wholly preventing or greatly retarding the action of these organisms. These chemical substances are generally classed as antiseptics, and it is but natural that attempts be made to use them in the preservation of food. Their application is, however, restricted by the fact that many of them are actively poisonous, or render the food unpalatable, or

that they are too costly for use on a commercial scale. Those in common use differ from the old preserving materials in being almost without taste or odor, and in that they may be used in a sufficient quantities to retard the action of ferments without being detected in the food.

At the present time the chief chemical compounds, other than salt, sugar, and alcohol, used in the preservation of food are the following: 1. Borac or boracic acid and borates, the so-called "boron preservatives." 2. Sulphurous acid and sulphites. 3. Fluorides. 4 Salicylic acid. 5. Benzoic acid or benzoates. 6. Formalin or formaldehyde.

The boron preservatives are apparently the most used, and are preparations of boric acid and borax, with or without admixture of other preservative ingredients, such as salt, saltpetre, sugar, sodium carbonate, etc., and are generally sold in the form of a white powder under a great variety of names, which, as a rule, afford no clue to their real nature. They are commonly used in milk, cream and butter, for preserving meat food generally, and, to a smaller extent, in beverages.

Salicylic acid is said to come next in importance as regards the extent to which it is used as a preservative. It is a white powder, and is employed chiefly in wines, beer, cider, and temperance drinks, and in foods derived from fruit, as jams and jellies, in order to prevent alcoholic and other fermentative changes. It is also said to be used in canned goods.

Sulphurous acid, sulphites, benzoic acid and the benzoates are generally used in preserving beverages. The latter is also added to fruit and vegetable preparations, sometimes to canned soups, and more rarely to dairy products.

Formalin is a 40 per cent. solution of formaldehyde in water. It is diluted to various strengths and sold under such names as "freezine," "iceline," etc., as a preservative for milk chiefly, and to a less extent for other foods. In concentrated solutions it has a strong irritant odor, but used in milk in sufficient quantities to retard souring, it cannot be detected by taste or smell.

Nearly all the preservatives now on the market are advertised as being "entirely wholesome," "capable of keeping the various articles of food perfectly sweet and fresh for any length of time without the use of ice," that "its ingredients are all as healthful as salt," etc., etc. On account of the perishable nature of nearly all our foods, it is obvious that a substance having the properties claimed for the various commercial food preservatives would be of incalculable value. At the same time, it is important that nothing should be added to food which is toxic itself, or which interferes even to the slighest extent with the processes in the body. This last point is especially important in its relation to invalids and children.

Just whether these so called chemical preservatives are injurious to health is a disputed point. Formalin is, however, generally recognized as too strong a disinfectant to be employed in the preservation of human food, and its use for that purpose is therefore prohibited in nearly all countries that seek to control the nature of the food supply.

The effect on the system of small quantities of boric acid, borax, salicylic acid, salicylates, sulphurous acid, and sulphite has been thoroughly studied by the Department of Agriculture at Washington, and the conclusion reached was that when even very small quantities of these materials were taken into the system, they produced injurious effects. This is also the opinion of many medical men throughout this and other countries. It is not claimed that the small amount of preservatives a person would get from eating catsup containing benzoate of soda, or butter to which borax had been added, would do harm; but when we remember that milk, butter,

some kinds of cheese, meats, canned fruits, canned vegetables, etc., may all contain one or other form of these chemical preservatives, it will be seen that it is quite possible that in the aggregate a person may be quite unconsciously taking into his food a quantity of preservatives which may be decidedly injurious.

When a food is preserved by means of salt, sugar, or by means of smoking or drying, it is at once evident to the consumer; but if the food contain these newer preservatives he may not be able to detect them. Their use may possibly enable him to use inferior goods or to exercise less care in their preparation; but that should not be a valid argument in favor of their general use. Good wholesome foods have been prepared without the use of these preservatives, and in view of the definite conclusions of Dr. Wiley's investigation and the opinion of many who should be authorities on the subject, it would appear as though the consumer had a right to know whether the goods he purchases contain preservatives or not. So long as there is any doubt as to the wholesomeness of these materials, the public should be protected. Either the use of the preservatives should be prohibited, or the manufacturer should be compelled to state on the package in the plainest possible way the name and the amount of the preservative employed.

Coming now more particularly to milk and its products, there is a growing tendency to use preservatives to keep milk sweet. Milk is one of the very best media for the development of germs, and when drawn from unclean cows by unclean milkers in dirty stables, it is very likely to be very badly contaminated. If allowed to stand in the stable for sometime after the milking is done, matters go from bad to worse. It is not necessary to go into all the details as to how milk should be handled, it will be sufficient to point out that by exercising care and cleanliness and by properly cooling, milk can be kept in a perfectly sweet condition until delivered to the factory or to the consumer. The use of preservatives removes the incentive to cleanliness and encourages careless, slovenly, and dirty habits in all stages of the work, because it is known that the milk can be kept sweet anyway. The preservative does not destroy the myriads of germs which dirty milk contains; it only holds them in check, so that such milk may come to the consumer very heavily loaded with all manner of germs. Furthermore the preservative retards the development of the lactic acid ferments, which naturally control the putrefaction and other undesirable germs in milk, and these develop bad flavors even though the milk is still sweet. When we consider that milk frequently forms the main part of the diet of invalids and infants, those who are least able to withstand any injurious effects preservatives may have on the system, it is at once evident that milk, of all foods, should be kept absolutely free from these materials, and that every effort ought to be made to see that the producers and dealers do not use them. A further difficulty in this connection is that unless something is done to keep the public informed regarding the nature of the preservatives on the market, the contention of the vendors as to the convenience and harmlessness of them will prevail, and purchaser, dealer, and consumer may all be adding preserving material to the same milk, and thus render it wholly unfit for use.

With reference to the use of preservatives in milk intended for cheese and butter factories, it is impossible to condemn it too strongly. It not only encourages carelessness, but the man who does it decreases the yield of cheese from all the milk put into the same vat, for any material added to milk that will keep it from souring will prevent normal coagulation of all the milk with which it may be mixed. Consequently, it is to the interest of

any farmer to see to it that his neighbor does not use these materials. Again, as stated previously, preservatives may be added in sufficient quantity to check the lactic acid fermentation and thus the milk does not sour, but other undesirable germs may develop and cause bad flavors which will give the cheesemaker much trouble. Furthermore, it is argued by many that a little soda can do no possible harm to the milk, and yet it helps to keep it sweet. Soda is an alkaline substance, and a comparatively small amount of it will seriously interfere with normal coagulation of milk. Further, it prevents milk from souring by neutralizing the lactic acid as it is formed, and produces conditions favorable for the development of many undesirable germs, and bad flavors result. When such milk is mixed with that received from other patrons, not only the yield of cheese may be reduced, but the quality will also be affected, and, conseqently, the cheesemaker and patrons all suffer loss.

It is impossible to go into all the ill effects of preservatives in milk, but sufficient has been indicated to show that no man should be allowed to put any preserving material into milk, whether intended for town or city customers or for factory use, but that every effort ought to be made to produce clean, wholesome milk and to have it placed in the consumers' hands in the cleanest and most appetizing manner possible.

THE CREAMERY OUTLOOK.

By Prof. H. H. Dean, O.A.C., Guelph.

Because of the fact that in these modern times people say, "Give us the luxuries of life and we will do without the necessaries," and because of this other fact, that the cheese factories now have rivals in the milk condenseries and in the large and growing demand for milk in towns and cities, which will keep them pretty busy to meet the competition offered—in these facts lie the hopes of creamerymen. The demand for first-class butter seems difficult to fill. Tons and tons of butter from cold-storage are used during winter, though we have never seen any first-class butter come out of a cold-storage after holding it for two months or over. It seems to me that if more creameries would cater to the winter trade with fine, fresh butter, which commands from 32 to 35 cents per pound, it would be a paying business.

About the only element of discord in the creamery outlook at present, is the bad state of trade in Great Britain. At one time we might have been alarmed at reading: "We in England are able to get plenty of butter from all parts of the world, and do not, at any rate just now, need to consider Canadian for any time." Happily for Canadian creameries our home markets can easily consume practically all our butter, under normal conditions.

The outlook for creameries, then, is very satisfactory from the market end of the business, and we need not worry ourselves in Canada that out of nearly 400,000 packages of butter received in Montreal last year, only a little over 90,000 were exported. It is estimated that the total make of Canadian butter is about 2,000,000 packages, of 56 lbs. each. The fact that we are able to consume this amount of butter yearly speaks well for the gastronomic butter capacity of our people, but when we reduce this to a basis of per head population, it is less than 20 lbs. to each person in a year.

When we consider that butter is the great oil for the brain, and that brain workers are more and more in demand, we need have no fear for the future demand of what is admitted to be a luxury, but a luxury that is becoming more and more a necessity.

The Other Side of the Picture.

He who looks on the rosy side of life is usually welcomed everywhere. The world is looking for optimists, and usually has little use for a pessimist, who has been defined as one who, when given the choice of two evils, selects both. However, we should be unwise did we not consider some of the defects of the creamery business, and thereby pave the way for improvement. Some men pride themselves on being "constructionists" and not "destructionists." But we are admonished, "Not to put new wine into old bottles." Some of the creameries (bottles) are scarcely able to contain the new wine of improvement which is demanded in order to make their butter of first-class quality. Carlyle said of England, that it had a population of about 30,000,000, then added this sententious comment—"mostly fools." We should not care to be guilty of a similar charge against farmers, buttermakers and creamerymen, but these certainly do some things which appear to be foolish. One of the old English poets has this verse:—

> "Counter & Clubb were men in trade whose pains,
> Credit, and prudence brought them constant gains.
> Partners and punctual, every friend agreed
> Counter & Clubb were men to succeed."

We have here the very essence of commercial success: "pains," "credit," "prudence," "partners," "punctual"—who would not succeed under these conditions?

Confucius said: "It is only the supremely wise or the deeply ignorant who never alter." Some men are so "sot" in their ways, that the very idea of "change" is repulsive to them. These men are likely to get left in the race of life, then how lonely they will be. Stevenson said, "It is better to be the slave of the worst tyrant that ever lived than to be nobody's dog."

There are a number of things in connection with the creamery business that to us look as if they could be improved.

Practical Suggestions.

The Farmer's Side of the Question. There is great need of more milk and cream and cheaper production. Most of our creameries are not running to full capacity for more than three months of the year—most of them for not more than one month. This is a loss to the farmer, and to the creameryman. As usual, the burden of the loss is borne by the farmer. The other classes have a facility for shifting burdens onto the back of the patient farmer. Better cows, cheaper and more feed, better stabling, greater skill and care in feeding cows, and in handling milk and cream, are important points which should receive the attention of every creamery patron.

Tainted cream, thin cream not sufficient to make it a paying proposition—these are points which must be considered by every dairy farmer who patronizes a creamery, and these are defects for which the farmer is responsible. During the months of October and November each year the Ontario Agricultural College Creamery reputation is in great danger of being lost,

and certainly receives some very severe jolts, through carelessness on the part of patrons who allow cows to eat turnip tops and who send cream that is impossible to make into fine butter.

COST OF HAULING CREAM. Closely associated with the foregoing is the question of hauling cream. In our own creamery, where cream collectors are paid from $3.50 to $4 per day, we find that the cost of hauling cream during the season of 1908 (April to November inclusive) varied by months from 1.56 cents per lb. fat (June) to 3.3 in November, and 3.64 in April, on one route; from 1.39 cents to 3.67c. on another route; and from 1,31 cents to 1.85 cents on another. The average cost of hauling per lb. fat for the season was 2.1 cents, 1.9 and 1.5 cents, respectively, on the three routes.

The total monthly delivery in pounds of fat varied from 817 (April) to 2,307 (June) lbs. on the first route, making a total of 12,000 lbs. fat in round numbers for the eight months; on the second route the total pounds fat delivered monthly ranged from 762 to 2,582, and totalled 11,500 for the month. On the third route the monthly deliveries ranged from 1,698 lbs. to 3,772 lbs. fat, totalling 21,711 lbs. fat for the season.

The point I wish to emphasize is, that the cost of hauling is very much increased with a small supply of cream. In our case, in the months of April and November, the amount of cream delivered cost us practically all that we received for manufacturing (4c. per lb. fat), in the months of June and July the cost per pound of fat was about one and one-half cents per pound. For the whole season the cost of hauling was practically 2c. per lb. fat (1.927c.).

How to get the cream to the creamery more frequently and not increase the cost of hauling, is a problem which ought to receive very careful consideration by both farmers and creamerymen. We have wondered if electric railways and some form of automobile cream wagon, where roads are fair, might not help to solve the problem.

CHEESE VS. BUTTER AS PROFIT PRODUCERS.

While the creamery patrons may have been dissatisfied to some extent, and thought they ought to have received better prices; and while some creamerymen may have been anxious because of this dissatisfaction on the part of the patrons, they may have this consolation, that patrons of creameries during 1908 probably received greater returns than did those who patronised cheeseries, if the results at the Ontario Agricultural College may be taken as a criterion.

By way of explanation, regarding the table which follows, we may say that milk was hauled and cheese made at a charge of 1½ cents per pound. Those who delivered their own milk were charged one cent per pound of cheese for making.

In the creamery branch, cream was collected and made into butter at a charge of four cents per pound of fat. Those who delivered their own cream were charged three cents per pound fat. The table shows the relative returns by months to both cheese and butter patrons on the basis of the fat delivered, which, while not a correct basis, is possibly the best for the purpose.

AVERAGE PRICE PER LB. FAT PAID TO CHEESE PATRONS.

Month.	Lbs. fat.	Paid patrons.	Average price per lb. fat.	Cheese made lbs.	Selling price.	Lbs. milk per lbs. cheese.
		$ c.	c.		c.	
April	873.82	208 43	23.85	2,093	11.37	10 96
May	974.29	241 63	24.80	2,401	11.5	10 97
June	1,202.11	331 02	27.53	3,221.5	11.65	10 44
July	836.76	237 65	28.40	2,171.75	12.3	10 97
August	687.58	195 99	28.50	1,773	12.5	10 67
September	631.57	180 92	28.65	1,638	12.5	10 47
October	562.41	145 03	25.87	1,348.5	12.15	9 94
November	265.88	64 66	24.32	608	12.08	9 92
	6,034.42	1,605 33	26.60	15,254.25	....	....

Average selling price of cheese for season, 11.93 cents.

AVERAGE PRICE PER LB. FAT PAID TO CREAMERY PATRONS.

Month.	Lbs. fat.	Paid Patrons.	Average price per lb. fat.	Lbs. butter.	Average selling price.
		$ c.	c.		c.
April	3,633 57	1,210 75	33.33	4,106	32
May	5,320 17	1,541 20	28.87	6,128	27.6
June	10,688 87	2,429 65	22.6	12,403	22.5
July	9,358 07	2,243 29	23.8	10,926	23.5
August	9,145 97	2,396 34	26	10,833	25
September	8,597 33	2,284 85	26.4	10,307	25
October	6,216 82	1,761 78	28.2	7,403	27
November	4,329 78	1,331 17	30.6	5,137	29
	57,290.58	15,199 03	26.53	67,243	....

Average selling price of butter for season, 25.53 cents.

As we practically must have a certain amount of milk for cheesemaking during the year for educational and experimental purposes, when we lost in the spring some cheese patrons, and saw that we were likely to lose others, owing to the relatively lower price received for cheese compared with butter, we said to them: "If you will continue to send milk to the cheese room for the entire season, we will make up to you any difference there may be, between the price paid to our butter patrons and that which you receive, and in addition we will pay you 15 cents per 100 lbs. whole milk, in lieu of the skim-milk."

You will observe by the table that the average price received per lb. fat by the cheese patrons was 26.6 cents per lb., while the butter patrons received an average of 26.53 cents—or practically the same as the cheese patrons were paid, while the latter had in addition the skim-milk. What we had to make up to the cheese patrons was practically the value of the skim-milk. This amounted to $133.75 on about 103,000 lbs. whole milk. The amount of money per cheese patron which we had to pay as a bonus varied from $7.80 to $55.73. The latter patron delivered 40,650 lbs. milk, so in his case it was quite an item.

CONCLUSIONS.

In order to make the creamery outlook even more promising, we need among other things:

1. MORE EDUCATION. An American creamery man, dealing recently with the question of education for the buttermaker, said: "The guardian genius of democracy is always the cultivated mind. It is the only dictator that free men acknowledge, and the only security that freemen desire." Our farmers, cream-haulers, buttermakers, creamerymen—yea, we all—need more education.

2. WE NEED BETTER DAIRY LEGISLATION. While it is true that you cannot make a man honest, or a good farmer, or a capable cream hauler, or a first-class buttermaker by Act of Parliament, yet a great deal can be done by our legislators to assist in these things.

As an example of what seems to us a lack of knowledge in dairy legislation, we may cite a couple of clauses from recent dairy Acts: "All milk containing less than thirteen per cent. of total solids, of which three and three-quarters per cent. must be chemically dry butter-fat, shall be deemed below the standard required in creameries for butter manufacture." With all due respect to the framer of the Act, we trust that we may be allowed to observe that this is out of date. What have the "total solids" of milk, other than the fat, to do with milk for buttermaking? Would not milk containing 3 to 3½ per cent. fat make good butter? Why "chemically dry butter-fat?" Would not fat determined with the Babcock tester be all right for buttermaking? This clause in the Act was framed twenty years ago, and should now be dropped.

The second citation is with reference to the legal definition of a Creamery We read "Creamery means a place where the milk or cream of not less than fifty cows is manufactured into butter." Now if we understand the meaning of creamery, the fundamental idea contained in it is *co-operation*. Where two or more persons join together for the purpose of making butter, such a place is a "creamery." The number of cows has little or nothing to do with it.

3. PASTEURIZATION. The last need we shall mention is, Pasteurization. This we consider to be one of the greatest practical needs for a steady improvement in the quality of butter. It will not do everything, but it will go a long way towards lessening the output of poor butter.

Education, Legislation, Pasteurization—these three, but the greatest of these is Education.

A GENERAL SURVEY OF THE DAIRY INDUSTRY FROM A CANADIAN STANDPOINT.

BY J. A. RUDDICK, DAIRY AND COLD STORAGE COMMISIONER

When considering a choice of subjects for an address at this convention, occurred to me that "A General Survey of the Dairy Industry from a anadian Standpoint" should be of interest, in view of the important develments which are now taking place in various parts of the dairy world, me of which may have a very decided influence on the future of the anadian dairy industry. We must keep our eyes open to what is going on ound us and study the march of progress in other countries if we would be lly prepared to face the competition which we are likely to meet in the

world's markets. In these days of rapid and safe transportation the four corners of the earth are brought into direct contact, and distance and cost of carriage no longer stand as obstacles in the way of the free movement of dairy produce from one point to another in times of local scarcity or over supply. Anyone who would have suggested sending Canadian butter to Australia or bringing it to Canada from New Zealand or Siberia, would have been considered mad not so very long ago; and yet, that is what has actually been done during the last year or two. Extended commercial organization is also a factor in promoting the trade in butter and cheese between different countries, and we have amongst us representatives of houses whose ramifications extend from that great centre of consumption, Great Britain, to every important field of production in the world.

One of the notable features of the dairy produce trade during the past ten years, has been the large increase in butter consumption in Great Britain and in Germany. A few years ago Germany was an exporter of butter to a large extent; but that is a thing of the past. The improved condition of the industrial classes in Germany enables many of the people to use butter who a few years ago did not know the taste of it. This increased home demand has absorbed the whole production of the country and calls for a large importation from abroad. The annual importation of butter into Germany now amounts to something like 100,000,000 pounds, which comes principally from Denmark, Holland and Russia. If we are to take any note of competition or the absence of it, we must recognize that this Germany demand is of real interest to us, because, lacking that outlet, practically all the butter which now goes there would be dumped into England, with what result it is hard to say; but it certainly would not improve the tone of the market. It is true that our export of butter to England has grown so small as to cease to be of much importance in itself; but I look upon butter and cheese as so closely related that they should always be considered together. Conditions of production are such in many places that an over production and reduced price of one article immediately result in an increased production of the other.

Looking over the field of international trade in butter, the first point to note is that the consumption of butter in Great Britain—which country is by far the largest importer of this product—has increased at a very rapid rate for some years past. The imports for the year ending June 30th, 1908, exceeded those of 1899 by 81,753,520 pounds, and as the home production in Great Britain does not change much from year to year, this large increase may be attributed to increased consumption. As for the exports by countries, we are naturally attracted first to Denmark, with an annual export of about 200,000,000 pounds, and nearly double that of any other country. The story of Denmark's butter trade is so familiar that it needs no more than passing mention, especially as there is no evidence to show that there will be much change in the volume of Danish exports in the immediate future. The Russian or Siberian export of butter is now easily second to Danish in volume, and it is growing rapidly; but I shall refer to it later on. Australia in times of plenty, that is to say when there is sufficient rain, ranks third in the list; but the supply of butter from the Commonwealth will always be a little uncertain because of weather conditions. For instance, in 1902 Australia exported only 7,777,971 pounds of butter, owing to the prolonged drought; but such are the marvellous recuperative powers of the country that in 1904, after good rainfall, the quantity had risen to 64,788,542 pounds. Holland takes fourth place with a steady export of about

50,000,000 pounds a year. As the Dutch co-operative associations, when they build a new creamery, borrow the money and arrange the payments to cover a period of fifty years, it would seem to be a reasonable inference that they intend to keep right on making butter. History tells us that it takes strong influences to swerve the Dutch from a course which they have once decided upon.

New Zealand, Finland, France, and Sweden each export between 30,000,000 and 40,000,000 pounds a year; but New Zealand is probably the only one of these countries which is likely to show an increase in the future. Nor is it probable that there will be much change in either direction in the older countries.

At one time we were told that Argentina was the coming country in the butter trade; but the arrival seems to have been delayed. As a matter of fact, there has been no increase in the shipments of Argentine butter since 1902, and those who know the country, while admitting its suitability for dairying, say that the present inhabitants will never become dairymen on a large scale.

Possibly the most interesting, because it promises to be the most serious competition which some countries will have to meet, comes from Siberia. The building of the Trans-Siberian Railway has opened up an enormous territory which is apparently better suited for live stock industries than for other lines of farming. Owing to the existence of numerous navigable waterways which cross the railway at right angles and act as feeders to it both from the north and from the south, the extent of country which has been given communication is many times greater than would ordinarily be served by a single line of rails.

The first butter was exported from Siberia in 1894, and the quantity was only 14,400 pounds. The principal growth has been in quite recent years. The development of Siberia as a dairying country is due to the remarkable migration of peasants from European Russia. The *Pall Mall Gazette* of London is my authority for the following figures: "Up to the end of 1905 the average annual migration across the Urals was about 60,000 persons. In 1906 this number was increased to 180,000; in 1907 the total was nearly 500,000; while in the first three months of 1908 70,000 families, or approximately 420,000 persons settled in Siberia." If you imagine the present settlement of the prairie provinces of Canada as progressing at two or three times the present rate, you will have some idea of what is going on in Siberia.

In one respect the Siberian competition is not as serious as it might be, for in spite of the skill of Danish buttermakers, who are largely employed, the quality of the great bulk of the product is only second grade, owing to the unsanitary conditions under which the milk is produced. The people are extremely poor, with primitive surroundings, and a high standard of cleanliness is not to be expected in such circumstances. On the other hand, these very conditions will permit the Siberian farmer to continue the production of butter at a rate which would be ruinous to Canadian or other English speaking farmers with their higher scale of living. Our safety lies in bringing to our dairy operations the advantages which a more advanced civilization gives us in producing a superior article, and increasing the flow of milk by improving our dairy herds.

Turning now to the cheese branch of the dairy industry, we are confronted with another set of conditions. In the first place, the total consumption of cheese in Great Britain, almost our sole market abroad, has not permanently

increased in ten years, nor is there any evidence that it will do so in the future. Our chief hope for increased outlet at present prices, apart from what may be gained by improved quality, seems to lie in the encouragement of a larger consumption in Canada, in which direction there are greater possibilities than are generally supposed. Canadians take some pride in the fact that they are by far the largest exporters of cheese in the world. The country next in the list, which is Holland, has a little over half as much to her credit; or, in other words, Canada will this year export about 170,000,000 pounds of cheese, while the Dutch exports are only 100,000,000. Moreover, only about one-third of Holland's trade is with England. Add to this the fact that the Dutch cheese are of a different variety from ours, and go largely to markets for which our cheese are not suited, and it will be seen that the competition either directly or indirectly is not as keen as it would be if the cheese were of the same kind as ours.

Switzerland is the next largest cheese exporting country; but as only a very small percentage of the Swiss cheese reaches the British market and the whole of it is different in character from the Canadian, we need not concern ourselves very much with it at present.

The Italian export, consisting largely of Gorgonzola cheese, follows next in the order of quantity. Although the Italian output seems to be increasing somewhat, it does not, on account of its character, compete directly with Canadian. It would be a mistake, however, to assume that there is no competition between cheese of different varieties, or that one kind is not often substituted for another.

The United States, although still the greatest cheese producing country in the world, and at one time Canada's most formidable rival in the British market, has ceased to be a factor in the international trade in cheese, because practically the whole output is required for home consumption.

The English and Scotch cheese, consisting chiefly of Cheddar or allied varieties, though not exported, is for that very reason of great importance in the British market, especially as the quantity produced far exceeds the Canadian output or that of any other country except the United States. There are no accurate statistics of the production of cheese in Great Britain, but it is estimated to be at least 300,000,000 pounds a year.

Last, but not least, we have to consider a country which is reaching out for a share of England's cheese trade with an aggressiveness, and with a measure of success, which should cause Canadian dairymen to do some thinking. I refer to New Zealand, our only direct competitor of any consequence, if we do not include the Old Country itself. New Zealand cheese are of the same type as ours, and the cheesemakers receive their instructions from a Canadian teacher. Previous to 1906 the production of cheese in New Zealand had not shown any permanent increase in ten years; but since that year there has been a remarkable expansion, and the present season's output, which is expected to be at least 400,000 boxes, or probably 35,000,000 pounds, will be about three times as large as that of 1906. This sudden growth is due largely to the fact that the combined factories have turned their milk into cheese instead of butter, owing to the higher returns from cheesemaking. Should the relative price of butter and cheese be reversed, the production of cheese will fall back to the old level; but if the market continues as it has been lately, there will be a considerable increase in the quantity of cheese manufactured for some time to come. It is hard to say how much it may increase, because the country is capable of producing an

enormous quantity of dairy produce, and large areas are not well adapted for anything elese. Fortunately for us, dairying is not popular among the settlers; they prefer sheep farming as an ocupation. Dairying is, however, the most profitable branch of farming on small holdings in New Zealand.

While the quantity of New Zealand cheese is not yet large enough to prove a very serious menace in view of our decreased shipments, there are some features of this competition which should command our attention. In the first place the New Zealand cheese factories are larger than ours, some of them making as high as 140 cheese a day. This tends to give the output a uniformity of character and quality which cannot be so easily attained in small factories. In the second place the cheese are all practically cool-cured, because the weather is never as hot as it is here in Canada. Owing to the distance from the market, the cheese are at least two months old before they reach the consumer, and as they have to cross the equator in transit, they must be carried in cool storage, which ensures their delivery in cool condition. Moreover, as they land in England only during cool weather, they do not suffer from exposure to heat after reaching the market as ours sometimes do. It is generally understood, I suppose, that the New Zealand season is exactly opposite ours. Their summer is our winter. The season there is longer than it is in Canada, owing to the absence of any real winter, so that the first of the season's make arrives about the beginning of December, continuing all through the winter until the month of June.

Now, here is where the most serious part of the competition comes in. The supply of Canadian cheese during the manufacturing season exceeds the demand, as everyone knows, and British merchants stock up with the surplus against the period of non-production. When the Canadian cheese was practically the only cheese of its kind being imported, they were obliged to do this or go without. But with the New Zealand supply in view, the merchant is not so keen in placing his orders, especially if the quality of the Canadian cheese does not suit his fancy, or if he thinks the price is too high.

In this way the New Zealand cheese have a sentimental as well as a material effect on the market, out of proportion to the quantity offered.

Drawing on my personal knowledge of conditions in New Zealand as well as in Canada, I would say that the alarm expressed in some quarters concerning the New Zealand competition may yet be justified if Canadians do not make the best use of their opportunities. First and always I would urge every factory to provide for the cool-curing of their cheese. The presence on the market of so many cool-cured cheese from New Zealand will emphasize the superiority of mild flavored cheese. I cannot go into the question of cool-curing now, nor would it appear to be necessary. There are a sufficient number of cool-curing rooms in Western Ontario to furnish evidence of advantages to be derived from them, and if any one wishes to know the experience of those who have them, he need only make enquiries. I would like to impress this point, however: when estimating the benefit to be derived from cool-curing, do not forget to take into account the important effect it will have on the future of the industry. Perhaps I should add that I am still ready to furnish plans and specifications to all who may want to make use of them.

To finish this general or foreign part of our survey of the dairy industry, I submit the following tables of the exports of butter and cheese from various countries, compiled in part from the Year Book of the United States Department of Agriculture and partly from other sources.

TABLE 1. INTERNATIONAL TRADE IN BUTTER.

Country.	1906.		Country.	1906.	
	Exports. Lbs.	Imports. Lbs.		Exports. Lbs.	Imports. Lbs.
Denmark	175,043,639	13,049,158	Argentina	9,712,076	....
Russia (Siberia)	114,369,238	577,805	Austria-Hungary	7,740,648	....
Australia	75,765,536	70,143	Belgium	3,704,232	11,128,520
Holland	56,404,861	563,865	Norway	3,281,403	....
France	39,307,325	11,402,808	Brazil	....	5,344,412
New Zealand	35,865,200	....	South Africa	....	11,555,202
Sweden	35,712,817	1,316,117	Germany	....	80,896,179
Finland	33,192,114	....	Great Britain	....	477,092,448
Canada	18,243,740	....	Other countries	4,677,661	....
United States	12,544,777	....			
Italy	10,746,430	....	Total	636,311,697	612,996,657

TABLE II. INTERNATIONAL TRADE IN CHEESE.

EXPORTS, 1906.

Country.	Variety of Cheese.	Pounds.	Country.	Variety of Cheese.	Pounds.
Canada	Cheddar	200,824,470	Bulgaria	Various	6,606,741
Holland	Edam & Gouda	104,742,665	Germany	"	2,629,673
Switzerland	Gruyere	61,935,107	Russia	"	1,733,414
Italy	Gorgonzola	42,314,633	Other countries	"	9,111,773
France	Soft varieties	22,058,487			
United States	Cheddar	17,285,230	Total	....	483,937,265
New Zealand	"	14,695,072			

IMPORTS, 1906.

Country.	Pounds.	Country.	Pounds.
Argentina	7,304,669	France	44,714,972
Australia	304,951	Germany	48,187,525
Austria-Hungary	8,935,994	Italy	10,398,761
Belgium	30,333,690	Spain	4,255,835
Brazil	3,784,774	Switzerland	5,541,979
South Africa	3,228,593	Great Britain	289,371,824
Cuba	4,078,517	United States	33,848,766
Denmark	1,782,437		
Egypt	10,064,909	Total	506,138,196

These figures will serve as a comparison. I have not been able to get complete statistics of years later than 1906. As far as cheese is concerned, the only countries in which there has been any material change in 1907 and 1908 are Canada, United States and New Zealand, the two former showing a decrease and the latter an increase, as we have already indicated. With respect to butter, Siberian exports have been largely increased. Australian increased in 1907, but fell off again in 1908. New Zealand and Canadian

exports have also decreased. Of course it will be understood that the exports of a country do not bear any regular relation to production. That depends on home consumption, as we have seen in the case of Great Britain and of the United States. I have given you the export figures, because the others are not available and would not be so interesting or instructive if they were.

Having completed this somewhat rapid survey of the international trade in butter and cheese, I ask your attention now for a moment to some aspects of the industry in Canada.

Our exports of butter reached the maximum of 34,128,944 pounds in 1903, and then declined to less than 4,000,000 pounds in 1907. The figures for 1908 will show an increase of probably one and a half million pounds over 1907.

Canadian cheese exports reached the maximum of 233,980,716 pounds in 1904, and they also have declined. It is estimated that the exports for the season of 1908 will not be over 170,000,000 pounds, making a total shrinkage of nearly 800,000 boxes, of 80 pounds each, since 1904.

This rather startling decrease in the export of Canadian dairy produce has been looked upon in some quarters as an actual decline of the industry in this country. I do not think that view of the matter is justified if we consider all the facts which bear on the question. In the first place the seasons of 1907 and 1908 were extremely unfavorable for the production of milk in the principal dairying districts, while on the other hand the seasons of 1903 and 1904 were quite the reverse. The increase in the condensed milk industry has also had an appreciable effect on cheese and butter production, but the main reason for the decrease in the exports is to be found in the increased home consumption.

As it appears to me, there are three factors which have contributed to this increase. First, there is the growth of population. There are probably 1,000,000 more people in Canada at the present moment than there were in 1904. I should say that that number of people would consume at least 20,000,000 pounds of butter, and milk and cheese equal to another ten million pounds. Then there is the increased purchasing power of the people as a whole, which permits them to spread the butter more thickly and to indulge to a greater extent in the use of cream, ice cream and other milk products. Last, but probably not least, the improvement in the quality of butter has encouraged a tremendous increase in its general consumption. Taking all three factors together, I think it is safe to say the falling off in exports is fully equalled by the increase in home consumption.

I see no reason whatever to deplore the fact of our decreased exports. On the contrary, we have every reason to congratulate ourselves that we have found another outlet in the enlarged home market. It must be apparent to anyone who has given the matter a thought, that if we had continued to ship as much cheese of the same quality to Great Britain as we did in 1904, the market would have been overdone and more or less demoralized. In any case, the present level of prices could hardly have been maintained. The lesson for us is that we should give more attention to our home trade, which has always been of more importance than we have generally recognized. I have only to state that we consume in Canada in the shape of milk, butter, cheese and condensed milk over two-thirds of our total dairy production, to prove how important it is, and in doing so I submit a fact which has been generally overlooked. We can, I believe, increase the consumption of cheese in Canada to a large extent by giving it to the people in convenient form, of the right character and quality and properly matured. There is an enormous demand for cheese in Canada which is not satisfied.

By improving the quality and lessening the proportion of heated, strong flavored cheese, the consumption would be increased in Great Britain also.

I do not want anyone to think that I regard the Old Country market as unable to take a larger quantity of our butter and cheese than it did last year. I believe there might be a much larger share of Great Britain's requirements in dairy produce supplied by Canada if we are careful to send them the right quality, and the kind which will encourage consumption. We have this satisfaction, that the Old Country will give us the preference over continental countries, everything else being equal.

There is no reason why there should not be a large expansion of the dairy industry in every province of Canada as well as in Ontario. I hope the movement for the improvement of dairy herds will help in that direction, even if new territory is not opened up.

Perhaps one of the best arguments that can be used in favor of dairying as a profitable branch of farming is to point to those districts or counties where it has been most extensively followed, for there you will find the most prosperous farming communities.

THE KEEPING QUALITIES OF BUTTER.

By Prof. S. F. Edwards, O.A.C., Guelph.

The problem of the keeping quality of butter is one of interest to every buttermaker. We know that butter made from ordinary unpasteurized cream without a starter is very short lived. We know that pasteurized cream ripened with a good starter is greatly superior in keeping quality. Experimental work in the dairy at the Ontario Agricultural College pointed to the conclusion that butter made from pasteurized sweet cream kept best of all. It has been commonly supposed that salt in some way conferred better keeping quality, although recent investigations throw considerable doubt upon this point, the salt appearing in some cases to hasten the deterioration of the butter, rather than enhance its keeping quality.

The problem is largely a bacteriologic one. Up to about a year ago, however, very little reliable work has been done in America in a study of the microscopic life which is present in butter until it has become unusually rancid, and of successive stages in the decomposition which render it unfit for use. In Europe, where most has been done along this line, the conditions are so radically different as to make much of the work done of scarcely any practical value to us. Little, if any, of the European work has had to do with actual cold storage and the conditions obtaining at temperatures below zero centigrade, and those above freezing point are so far from parallel, and the changes which may take place are so diverse, as not to allow of ready comparison.

During the past year, technical studies of this problem have been in progress at the Michigan Agricultural Experiment Station, and inasmuch as the dairy conditions in Michigan and Ontario are more or less similar, I shall review briefly the results obtained thus far in the investigations at that station.

The importance of such research to dairy interests at large is hardly to be over estimated. It is, of course, not to be expected that a butter which has been kept for some weeks or months will retain all the delicate bloom and aroma so characteristic of perfectly fresh butter made according to the best known methods. Some butters do, however, come out of storage after several

months with a better flavor than other perfectly fresh butters which have not been so carefully made. Certain butters may even come out of storage better than when placed in. Again, two lots when received may score alike and, though kept under identical conditions, one lot may come out in excellent condition while the other may have deteriorated to such an extent as to render it entirely unsalable.

The purpose of the work at the Michigan station was to obtain a general view of the changes in cold storage butter, with a view to making further and more detailed studies of the problem.

From a review of the work of various European and American investigators, the following conclusions are drawn:—

"The term 'rancid' is not definitely fixed. Very probably there are different chemical compounds in different rancid butters. Free butyric acid certainly causes a rancid taste in butter, but its amount is not always high enough to cause an off-flavor. The rancidity of butter is almost certainly due to micro-organisms, some of which effect a decomposition, for butter sterilized by heat will keep indefinitely if kept from micro-organisms, light and air. The rancidity cannot be due to a fat decomposing ferment originally present in the milk, because if so, the butter from pasteurized or sterilized cream should keep; whereas, it spoils in the same way as ordinary butter, though usually much more slowly.

"All investigations show that the spoiling of butter is a process requiring the presence of air, beginning at the outside and slowly penetrating through the whole butter. A number of instances are on record of the finding of butter which had evidently been buried in bog water for centuries, in one case a sample of about twenty pounds having been submitted to the ordinary chemical determinations after its recovery. That under these conditions decomposition would take place very slowly indeed is not surprising, since these fatty acids are very difficultly decomposed in the absence of air."

Outline of the Work at the Michigan Station.

Samples were obtained during May and June by different members of the bacteriological staff, who personally observed the methods of manufacture, creamery conditions, surroundings, and everything which might affect the finished product—temperature of cream and wash water used, source of the water and ice, methods of obtaining and handling cream, personality of buttermaker, etc. Tub lots were secured from as many creameries as possible in the dairy sections of the State, seven sixty-pound tubs being ordinarily taken from a single churning at each place visited. These tubs were immediately tagged and shipped at once by express to the bacteriological laboratory at East Lansing.

The Score. Immediately upon receipt of the butter at the laboratory cold storage, the samples were scored by a dairy expert. Particular attention was given to flavor, texture, moisture and salt.

Storage. After the desired laboratory samples had been taken and the butter had been scored, each sample lot was divided as follows: The broken tub was kept at the station cold storage at the temperature of 38°-42° Fah. Of the six remaining tubs, two were shipped to each of three different cold storage plants subject to withdrawal as required for sampling.

About the first of November, one tub from each lot was scored at the storage warehouse where it had been kept, after which the scored tubs were brought to the local cold storage and sampled for the laboratory as required. At this time seventy-two tubs were examined at the rate of four a day. As soon as the samples had all been obtained, the sampled tubs were set out

without regard to order or place of storage, and scored again by a second expert butter scorer, the tubs being known only by number. The tubs were then disposed of, the duplicate samples being retained in the various places of cold storage for the later examination. On the first of February, the remaining tubs of butter were withdrawn from storage and examined as before. As the ordinary temperature was low at this time, the tubs were all assembled at the college cold storage for sampling and scoring.

DISPOSAL OF BUTTER. Since the sale of the butter used in these tests may be of interest, it is given here. The first lot was sent to New York in February and was priced as follows: One tub at 27 cents; six tubs at 25 cents; twenty-three tubs at 23 cents; thirteen tubs at 19 cents.

Of the second lot, that sent to New York arrived on a dull market and was sold in one lot, fifty-three tubs at 18 cents, which was one-half cent less per pound than ten tubs bought at a renovating establishment at this time, although this latter lot was withheld from shipment as being much inferior to the other. The average score for February was two and one-quarter points lower than in November, the two scores being 89½ and 87¼, respectively.

Extensive bacteriological and chemical investigations were conducted, and the various lots of butter were scored at the beginning of the work during November, and again in the following February.

Observations were made upon various factors influencing the scores as follows:

EFFECT OF TEMPERATURE. "With few exceptions all the samples of butter kept in the college storage where the temperature was above the freezing point—about 40° Fah.—had become entirely unfit for ordinary use before November. Of the eight best samples, the highest score at this time was 88 and the lowest 75, the average being 78.6. These samples were in most cases very rancid, but no other flavors were noted except that of moldiness.

"Results of observations with regard to the effect of water content tended to show that this factor did not affect the score. Although the salt content of the samples varied between 1.06 per cent. and 3.78 per cent., no difference in keeping quality was apparent as due to this single factor, the scores of the high salted and low salted samples approximating each other very closely."

EFFECT OF STARTER. "The use of a starter in preparing the cream for churning appears to have had a decided influence upon the scores, for, without a single exception, the average scores of the eight lots where a pure culture was not used are lower than the averages of eight lots where a commercial pure culture starter was employed.

"In the bacteriological work, there were isolated in all 879 pure cultures, belonging to six different groups of organisms and including molds, yeasts, and bacteria. A total of 87 different species of organisms were found in the butter, most of them only once or twice."

The origin of bacteria in butter is not always the same. Several kinds are the regular inhabitants of milk, some of them being able to break up the fats of butter, thereby causing rancidity. These organisms may be prevented from causing trouble by pasteurization of the cream before the ripening with pure culture starter.

Other bacteria are derived from the wash water. The Iowa Experiment Station found a direct relation between the bacterial content of wash water and the keeping quality of butter. This conclusion was confirmed later by

the Kansas Experiment Station. These bacteria may be kept out by pasteurizing the water to be used for wash water, cooling and using it immediately to prevent recontamination from the air of the factory.

Molds and yeasts are the regular habitants of the air of all rooms, on the walls of storing rooms as well as on the utensils.

The Michigan investigators do not attempt to draw final conclusions on the keeping quality of butter, but only to define the factory scientific problems furnished by the cold storage of butter, with a view to settling these problems by further research.

The creamery problems indicated are the improving of the quality of cream, the advisability of pasteurization, the use of ripened or sweet cream, and the salting and packing.

"We must first learn what micro-organisms are able to cause the rancidity of butter, then trace their origin, and lastly learn how to keep these organisms from the butter; or if this should prove to be practically impossible, how to avoid their development in butter. The only two means we have at present are salt and the effect of temperature. Low temperature entirely checks the growth of many organisms, and other species develop only very slowly. Salt decreases the rapidity of multiplication very much and may kill many cells. On the other hand, others are able to multiply even in concentrated brine. It is questionable whether or not the combined action of salt and low temperature is desirable, since the salt tends to lower the freezing point considerably. This, too, is a problem demanding further investigation before we can draw final conclusions."

INTRODUCTION OF THE NEW PRESIDENT.

The CHAIRMAN: In retiring from the position of President of this Association, I desire to thank the members of the Board of Directors for the courteous manner in which they have assisted me during the time I have been on the Board of Directors, and to wish the Western Dairymen's Association greater prosperity during the coming year. Allow me to introduce to you the President-elect of the Dairymen's Association of Western Ontario for the year 1909.

Mr. J. J. PARSONS, President-elect: It would be altogether out of place on my part to make a speech on this occasion, because I did not come here prepared to give one. If I did, it would be presumption on my part that I was going to be elected to this office, and I assure you I had not the slightest hopes of that until just recently. I want to thank the members of this Association and the officers for the honor that they have conferred upon me in electing me to the position of President for the ensuing year. I feel that it is a great honor. I little dreamt when first elected to the Board of Directors that it would result in my being President of this Association. It will be my earnest endeavor, if spared, to occupy the position, to do all in my power to continue the good work of the Association, because we must all admit that the work done by this Association has been marked all along the way by progress. I feel satisfied that, with the assistance of the Board of Directors elected to work with me, and with our Secretary, that I will have all the help that I require. I trust that for the present session those in attendance will listen with pleasure and interest and profit to the addresses that are to be given, and that you will all assist me in maintaining order. Mr. Parsons then took the chair and conducted the further proceedings of the evening.

ADDRESS.

By Lloyd Harris, M.P., Brantford.

The Mayor has welcomed you to our city, and I want to add to the words that have been spoken my appreciation of your having chosen Brantford as the place of your Convention this year. I hope so large and important a body as the Western Dairymen's Association will not come to our city with the intention of devoting their time to discussing dairy interests alone. I think you might spend some of your time in learning something about the industries we have here in our city. In Brantford, we are largely engaged in manufacturing. We have built up a city which is renowned from one end of the Dominion to the other, and in foreign countries, as a manufacturing centre. The large proportion of our maunfactories are agricultural implements, and we cannot make first-class agricultural implements unless we know something about the conditions under which these implements have got to be used. Therefore, we have to be in fairly close touch with agriculture.

I do not think dairying is an agricultural pursuit. I have always classed it as a manufacturing pursuit. You are endeavoring to produce milk at the lowest possible cost, and sell it at the highest possible price, either in its raw or its manufactured state.

I think I might class the bacon industry with the dairy industry. We are all delighted with the progress that has been made with the dairying industry in Canada. I do not think any one branch of agriculture has shown a more marked progress and prosperity than the dairy industry. When we look back upon what has been accomplished in the last ten or fifteen years, the figures which we have are simply stupendous. This great progress is almost entirely due to the fact that the Governments in this country have branched out in technical education for agriculture. The Government of the Province of Ontario has founded what is perhaps the most splendidly equipped institution in the world for the purpose of teaching the different branches of agriculture, with the result that the Agricultural College has turned out men and women who have been sent to different parts of Canada equipped with knowledge and information whereby they have been able to manufacture the product of milk into a better quality of butter and cheese, with the result that the increase in the wealth of this country has been enormous.

I think we ought to go still further. I have this question of technical education on my heart, and I am always glad to express my views on this question with the idea that perhaps others will get some views that I have, and recognize the great importance of technical education in this country, and do all they possibly can in the position they occupy to further this matter.

I would like to see the Government study this great question of technical education and get the greatest possible information they can. I would like to see a Royal Commission appointed, and I think the Dominion Government should take the initiative in getting information together. Let this Royal Commission enquire in the different countries of the world the condition in which the different industries of these countries are carried on, and find out if they have better agricultural training than we have in Canada, and bring the information back to us. I want agriculturists to assist us, and give us their co-operation and support in getting this information for the purpose of building up technical education, not only for agriculture and for artisans and other branches of industry, but that we may produce men in

this country of ours who will be able to cope with the great problem before us in developing the wonderful natural resources that we have.

Great progress has been made in the production of milk. I was reading last week that one of the speakers at the Eastern Dairymen's Association had said that he had carried on experiments to such an extent that he had been successful in getting the cost of keeping a cow for one month down to the sum of $2. That is a wonderful thing when we come to think of it. I do not know what the average farmer of Brant county pays to keep a cow for one month, but I think it is a great deal higher than $2. If the farmers could get that cost down to $2, think of all the increase of wealth it means in dairying operations. Dairying operations are only limited by the number of cows that can be milked on each farm. I was a farmer myself a few years ago. I thought I would like to have a large farm, and the largest herd of dairy cattle in the country. I bought a farm of nearly 1,000 acres, and the next thing I did was to put 400 dairy cattle on that farm. I wonder if anybody knows what it means to milk 400 cows?

The one reason we had to give up the dairy operations at Bow Park farm was the difficulty in getting the cows milked. I had been living in Europe before that time, and I had become interested in the development of a machine that was being perfected in Scotland for milking cows. They claimed that it could be put into practical operation, and I had enough confidence in it to give them an order to send out the apparatus to Canada, and I stipulated the condition that if it didn't work right I would not have to pay for it. I never paid for it. However, I understand that in recent years this machine has been perfected, and if it is, I think it is going to be one of the greatest aids to the dairy industry that has ever been invented. I am greatly in hopes that something will be done whereby this very difficult problem will be worked out to the satisfaction of all of us.

I do not propose to take up any more of your time. I simply wish to thank you again for your courtesy in inviting me here, and I hope your deliberations will result in a very great deal of profit to your Association, and that it will not be very many years before we see you back in Brantford. (Applause.)

The CHAIRMAN: I now have much pleasure in calling upon Prof. Ruddick to make the presentation of these trophies to the winner.

J. A. RUDDICK: It is a very pleasant duty I have to perform in presenting these magnificent prizes to the winner. It may be worth while to explain the nature of this presentation to some of you who may not happen to be familiar with it.

The large cup is a trophy which has been presented by the cheese buyers of Western Ontario, to become the property of the person winning it three times or twice in succession. It has been won already by Frank Boyes, R. H. Green, Oscar Schweitzer, Jas. Paton, J. E. Stedelbauer, and Miss Mary Morrison. This year the winner is T. J. Donnelly, of Union Factory, Elgin county.

The small cup is presented by Mr. Henderson, Manager of the Windsor Salt Co., and it becomes the property of the winner. Mr. Henderson has been very kind, indeed, in presenting prizes, not only for this Association, but to the Eastern Association, and in many ways contributing to the success of these meetings, I think the dairymen owe a great deal to Mr. Henderson for his kindness in that respect.

The J. B. Ford Co., of Wyandotte, present this fine set of carvers to the exhibitor showing the best finished exhibit of cheese, and it so happens that Mr. Donnelly takes that prize. Mr. Donnelly, I have very much pleasure in presenting to you these beautiful trophies. I am sure it must be a satis-

faction to you after your hard summer's work, because I know enough about cheesemaking to know that it does take hard work to win such success as you have. I think you are to be congratulated most heartily for having been so successful, and I trust you will be able to repeat your success and win this cup next year, and become the owner.

These exhibitions, such as you have here, are certainly productive of a great deal of good, and I would like to see the work extended considerably. There is a great educational feature in connection with such competitions, which is bound to reflect beneficially on the industry in which you are engaged. I have very much pleasure in presenting you with these trophies. I congratulate you. (Applause.)

Mr. DONNELLY: I assure you it affords me any amount of pleasure to secure the highest award at this exhibition. One gentleman stated last night about hens and roosters scratching gravel, and I can say that if you want to win this trophy you have got to get down and scratch gravel. I wish to thank Mr. Henderson of the Windsor Salt Co., for his kind donation, and I also wish to thank The J. B. Ford Co., of Wyandotte, Michigan, for their beautiful carving set. I feel something like the Irishman who was asked to give his opinion as to the best piece of pork in a hog. He said, "Faith I will take the piece between the nose and the tail." And in winning so many prizes, which I feel positively proud of, I feel something like the Irishman, as though I had the piece between the nose and the tail. The best part of it is, it is an Irishman that has won. (Laughter and applause.)

Mr. RUDDICK: Mr. Donnelly has another honor in connection with this competition, and that is, that he has two sons who also won prizes in the Butter and Cheese Competition.

The CHAIRMAN: It affords me a great deal of pleasure to have the honor of introducing to you this evening the new Minister of Agriculture. I believe this is the first public appearance of the honorable gentleman before an audience in this capacity in the western part of the Province. I bespeak for him your earnest attention, and I trust he will give you something to carry away of interest and profit.

IMPROVING FARM LIFE.

BY HON. J. S. DUFF, MINISTER OF AGRICULTURE FOR ONTARIO, TORONTO.

I am very pleased, indeed, to have the privilege and honor of putting in a few moments at least with you in connection with your annual convention. I was very pleased to-day when Mr. James told me what a fine meeting you were having in Brantford, and of the splendid audience that was present last night. I am also delighted to know that this afternoon this beautiful hall was filled with people interested in your work. I can quite understand that people who come to these meetings do so at a great deal of self-sacrifice. They leave their homes and their business and their work to come here in order to meet together comparing ideas and looking over the work of the past year, and go home with a fresh determination and renewed enthusiasm to enter the work of another year.

The Dairy Associations of this Province are among the greatest subdivisions of agricultural work in this Province. When we look back over the past and see what the dairymen have accomplished, we see it has been a matter of gradual but progressive growth. I often think that it is a pity that we, who till the soil, we who are the farmers of this beautiful country,

do not take greater pride in our work than we do. It has sometimes occurred to me that it is because of the fact that after spending so many hours working, we do not feel after the day's work is done like going around and fixing up this corner and beautifying this nook and giving everything that air of happiness and prosperity which does so much to make homes attractive. But, after all, we are gradually gaining and making rapid progress. I can remember when there were a great many log houses in the neighborhood in which I lived, and in fact, outside of a very few, I can remember when all the beautiful homes we have in that section now were built; and even now as we go about we can see a gradual improvement.

I do not propose to talk to you about the dairy interest, except in common with other interests. I know from looking at the papers this evening that last night you had statistics given you as to the development from year to year in connection with the dairying interests of this Province, and we have that sort of thing given to us in the newspapers from time to time, and you are all as familiar with it as I can possibly be.

As you go through the Province you will notice a great change in farm homes. You will notice that the log houses have disappeared, and the new barns are up and beautiful new homes, and although there is perhaps nothing at present to beautify the surroundings, as time goes on you will notice a few evergreens planted here and there, or some rows of maple trees, or the beautiful elm, of which we are all so proud. Our farmers are carrying out the idea that beautiful surroundings have much to do with success; and not only that, but these trees help to protect our buildings and our homes from the winter winds, and very often from the summer's sun.

It was said to-day that there should be something done towards keeping the boys on the farm. My own impression is, that no action of the Government or any other regulation will bring that about. You know it is the glory of the British race that they will strike out. We are great to-day in Canada, because of the hardy pioneers who came across the briny deep from France, England, Ireland, and Scotland in the centuries gone by, and the same spirit is true of the British people, no matter where you find them; and when you see boys raised on the farm striking out and becoming mechanics, doctors, lawyers or clergymen, they are only carrying out the instincts of their nature, and in the same way they leave their beautiful homes and strike out for the Western country and make homes for themselves on the prairies, and I do not think any legislation we can enact will make any man stay on the farm.

But there is such a thing, perhaps, as making the farm so attractive that young men will feel, after all, there is no place like the farm. I have seen a good deal of this Province. I have been mixing in public life for a number of years, and the last ten years it has been my privilege to see a good deal of what we call city or urban life. But I go home to the farm, and I think as I look over those fields, and I conclude that, after all, it is the most beautiful place in the world for me. I might have been constituted otherwise; I might have had dreams of becoming a merchant prince in the city, or one of our great lawyers, who has brought fame to this country and to their own farm homes; but I have not had these dreams. I have always thought there is no place like the farm, and I am on the farm to-day because of that fact. There is one agency that I think will encourage, if anything will, the young men to remain on the farm, and that is, the beautifying of the homes—giving the boys to understand that life on a farm is not the slavish life that some people say it is, and that as decade and decade of years pass by, conditions will become better, and that we will be in a better position to enjoy life than our fathers.

Life is not hard on some farms to-day. Some persons will say, "Yes, it is hard." *Well, it is hard in this way; inasmuch* as the man who makes a success on the farm or makes a success of a dairy herd, or by raising swine, or breeding horses, or any other phase of agricultural life, must work hard. He must attend to his business. But the same is true of every other line of life. There is not a successful doctor, lawyer, or clergyman in Canada to-day who has brought a name to the profession in which he is engaged, who has not worked hard. After their clerks have retired from the store, these men have spent hours and hours in their offices, in mastering their business, so that they can reach out and make more in the next great deal in which they are occupied.

The lawyers who occupy the high places in the legal profession have got there by hard work. Men never obtain high positions in any calling in life unless they work hard, but working hard should not be a drudgery. I sometimes think that the best man we have in Canada is the farmer that works hard. If there is any man to be pitied, it is the lazy man, and particularly the lazy farmer. (Applause.)

Beautifying the farms would have the effect, I think, of inducing the boys to stay on the farms. There is another way in which you might induce your boys to stay on the farm, and that is, to give them an idea as years roll on they will not have to work as hard as you did. I am sure almost every man will say, "I have not to work as hard as my father did." What work do we do in Ontario to-day compared with the work of the pioneers. These hardy men and women who made great sacrifices, and not only drove oxen wagons away back into the wilderness, but in many instances walked in, in order to erect the first shanty, and to have a little home until they could get the surroundings cleared in order to get a little of the necessaries of life.

As you look back over this beautiful Ontario, while we are proud of our cities and towns, as we should be, and while we are proud of the magnificent strides we are making in building up within our own borders such a splendid urban population, yet there is no class of people whose hearts should thrill with pride as the farmers, as they think of the hardships they have endured in order that we might have the beautiful homes we have to-day. When you think of the old days when it was chopping and logging, and logging and chopping—when it was a steady fight year in and year out with the gigantic forests with which this country was covered—and when you think to-day that that is all gone, and that the farms have all been cleared and commodious stables and barns erected, and lovely houses on almost every farm, surely it ought to be an incentive to a young man to live on a farm. And if that is not all, life on the farm is an occupation that he ought to be proud of. If, however, the condition and surroundings in which he was born and brought up do not induce him to stay on the farm, I think that boy had better not stay. He had better strike out and go wherever the bent of his mind may lead him, and if he should leave the farm and bring success to the vocation or calling in which he may cast his lot, then that is an honor to the old farm on which he was born and brought up.

Last night I was at a banquet in Toronto, given in connection with the Horse Show, and the Chairman, Mr. J. P. Allan, who is one of the merchant princes of the City of Toronto, and who was born and brought up on the farm, and who knew the hard work of a farmer's life in his early days, in speaking as he did of that old farm last night, made me feel that after all it might be said the city and farm are not so far apart. You know there are people in this world to-day who do not speak nicely of the city people, and ,some city

people who do not speak nicely of the farmers; but so far as I am concerned, I simply feel like treating the people of both classes like that with contempt. We should not have that sort of thing in this country of ours. It should be the interest of the city people to cultivate and cement and make more firm than ever that friendship and community of interest that links your interest and theirs, because you could not live without them.

Where would this beautiful city of Brantford be were it not for the splendid agricultural country surrounding? The same might be said of every city, town, and hamlet that we have in Ontario; they are all dependent on the farmer. You know the old song, "The farm feeds them all." But, after all, what would the farmer be without the cities and towns? We occupy a unique position as farmers to-day in Ontario in being closely situated, and having almost all the advantages that our brothers and sisters have who live in the cities. Why, a man living within ten miles of a city like Brantford is just as well situated as if he lived in the heart of the city. The same thing is true all over the Province. The very fact of all our relationship being of a nature that one is dependent upon another, and we should endeavor to cultivate that to such an extent that your boy or your girl will see a greater community of interest and see a greater appreciation of the work each of the other.

Agriculture has a great many diversified forms, and I will just speak of a few of these. You are engaged in dairying, and if you go to a locality where dairying is carried on, you will find that the farms are richer and more productive that where it is not. The richest land in this Province is land where that which is grown upon it is fed on the land and sold in beef and cattle, butter or cheese; because when you sell the food in concentrated form such as that, instead of robbing the farm, you are gradually building it up. No doubt many of you will say the land is not nourished as it used to be years ago when it was new land. I think it is true of the neighborhood in which I live, that the land is richer than when the trees were taken off. That is, the land which has been carefully taken care of and nourished and fed. Land cannot help but increase in value where dairymen carry on their operations to any great extent. It was my privilege last spring, and also last fall during the elections, to be up in the western part of the Province. I was through the Perths and the Oxfords, and as I travelled through these counties and saw those beautiful farms I do not think anybody can tell me that these farms are not better now than they were when the land was first cleared. Everybody knows they are, and why? Because through these districts the people are engaged in dairying, and in raising cattle, and in feeding the produce of their farms to their stock. In the section of the country where I live it was always a grain growing country from the first time the trees were cut, and they could have magnificient crops of wheat, and for that very reason they never branched off into dairying and other lines. In other sections the land was not so good when it was first cleared. I could take you up into the county of Grey, and take you through some townships that when they were first cleared had so much frost that the farmers became disheartened, and they were driven into the live stock business. To-day these townships are richer townships than those in the section where they grew wheat; and that came about just from the fact that they were forced, owing to the conditions in which they found themselves, to branch off into other lines.

There never was a time when there was more time for real successful grain-growing in this Province than there is to-day; and there never was a time when there was more room for dairying and live stock, sheep, swine, and horses, than there is to-day.

I sometimes think that the men who lead in these special lines of agricultural industry have done more for the people of Canada than any other class of men we have ever had, because they have been men of strong character, and men who have had hope in the future, and who knew all they had to do was to presevere and in the end they would conquer, and they have conquered. The result is that we find Canada to-day occupying a magnificient position, not only in relation to its dairy interests, but also in relation to its live stock and grain as well.

I am glad to say that the Government of the Province has always been imbued with the idea that it was their duty, as far as possible, to help the agriculturists of this Province, and I feel that I am speaking authentically when I tell you that every man who has had the honor to precede me in the position which I now fill, that of Minister of Agriculture for this Province, from the days when Mr. Charles Drury was appointed right down to the present time, felt that it was their duty to foster the agricultural interests of this Province and do all they could to help it along.

But someone will say, "What are you going to do about it?" Well, I do not know that I will promise to do anything. I have felt that we are spending so much money at present in connection with agriculture in this Province that we have got pretty near to the limit to which we can go. When you know that the last year's appropriation was about $775,000—more than three-quarters of a million of money spent in the interest of agriculture in the Province of Ontario—you will understand we are doing a great deal. You know the Province is not like the Dominion. In the Dominion Government they are better off than we are in one way, because they can make their own tariff and rake in whatever they want, and whatever they say we have to pay we must pay.

The provinces are not so fortunately situated. We have certain revenues, but we do not control these revenues. In fact, it just depends upon the growth and development of the revenues themselves more than any act of the Government, as to what we shall get from them. So you see, when you come to the Provincial Government and ask for money you must expect the Provincial Government will say to you, "We would not like to go any further in spending than we are doing."

There are many other ways in which the Governments of to-day are able to help the people of this Province. I had a gentleman call upon me to-day in Toronto from Eastern Ontario who went to the city of Montreal and was very successful in business and made a great deal of money. About twenty-five years ago he came back to the county of Glengary and bought a farm. He made up his mind he would come back to that farm and make it pay. He had been up to see the Premier in his Department, and he telephoned to me that he was coming down to see me. He had been a schoolmate of the Premier's in their early days, and so he came in and told me what he wanted. He said, "Although we don't look through the same political spectacles, I want to talk to you." I told him that it did not make any difference, and he said he thought we ought to have in this Province what he called a "Land-doctor." What he meant by that was that we should have devised in some way or other a plan whereby our farmers would be able to apply the outcome of scientific investigation to their farms. He put it to me in this way, "If I have a sick horse I send for a veterinary, and if the land is sick, don't you think I should have a doctor who understands it?" A man must understand chemistry to understand the land. There is a great

deal in it, and I made this suggestion, and he thought it a fairly good one. I said we could send broadcast through Ontario bulletins from the Chemistry department of the Agricultural College and give the farmers some idea how to treat different kinds of soil in order to bring about the best possible results.

We have one department that is already doing wonders in that direction. Mr. W. H. Day has charge of the drainage work at the College. There is no doubt that if this Province was properly drained it would grow one-third more grain or grass than it does. We have thousands of acres that it would pay the farmers to drain. It brings about the result that the farmer is not only able to get on the land earlier in the spring, but in a dry season that land will stand the drouth better. But of course a man might have a farm well drained that might not have a soil that would give the best results. The object of the gentleman who called on me was to say that the Department should have something that would enable the farmers to understand the different soils and drain them in such a way as to bring about the best results.

I cite this only to show that there is a development amongst the farmers of this Province all along the line. This man told me that when he built beautiful barns and a beautiful house he thought he would go into the dairying, and he got a splendid lot of cows. As he had no boys of his own he had to depend on other help, but it was so unsatisfactory that he cut it out, and now he is buying stock in the fall and feeds from one hundred to one hundred and twenty-five steers every winter. He dehorns them, and feeds them loose in large stalls, and he finds that his farm is becoming richer and richer every year. He told me that they grew on that one hundred and twenty-five acre farm in one year 10,000 tons of stuff. One winter when he was feeding so many of these steers they used a ton of straw every day for bedding, and you can facy a 125-acre farm given that kind of treatment must grow great crops. And he said tnat in one instance they grew five ton of clover hay to the acre. The farmer likes to have a little money at the end of the year. They do not feel that it is pleasant to work hard during the year and not have something to show for it except their board and clothes. Supposing you had a $5,000 barn and a $5,000 house, that is $10,000 invested in your buildings, what would you put your land value at? And this man said $100 an acre, that is in round figures $20,000 invested. Can you have a dividend a good deal better than bank interest over, after paying expenses? When I asked him this he said, "Yes." And after all that is the best test.

I do not propose to speak any longer. I only came up to wish you God speed in your work.

The Chairman: I wish to assure the honorable gentleman that the friend who called upon him in Toronto and brought to his notice the point in connection with establishing a land-doctor did a good thing, and the members of the *Western Ontario Dairymen's Association* have said for some time that the time was opportune for such a move. We want a chemist and a bacteriologist in connection with our work, and it seems to me that it would be a mistake on my part if I did not on this occasion clinch the idea he has thrown out, and tell him we are not going to stop, and we will perhaps approach him for some assistance in this line.

ILLUSTRATED ADDRESS.

Mr. J. A. Ruddick, Dairy Commissioner, Ottawa, then gave a very interesting lecture, illustrated with lantern slides of dairy buildings, dairy herds, and dairy farms in different parts of the world. His lecture took the audience on a trip around the world, and was much appreciated.

IN MEMORIAM.

Hon. Thos. Ballantyne.

That this Association, in annual convention assembled, desire to place on record an expression of their deep sense of the great loss which has been sustained not only by this Association, but by the dairying industry of this country, in the removal by death of the late Hon. Thos. Ballantyne, of Stratford, Ontario, who during his life time did more than any other man in Canada to promote what is to-day the great dairy industry.

Over forty years ago he with a few others introduced in this Province co-operative dairying, believing in the great possibilities of the industry. He never neglected an opportunity to preach the "Gospel of Dairying," whether as President of this Association (a position to which he was elected by his fellow-dairymen no less than nine times) or in his business relations as a cheese buyer and exporter, his watchword was always "Quality" and progressive methods, and his dealings were characterized by a high sense of honor and the advancement of the great dairy industry.

That this resolution be placed in the records of this Association and a copy forwarded to the family of deceased.

Mr. Harold Eagle.

That this Association in Convention assembled, desire to place on record an expression of their deep sense of the loss we as an Association have sustained in the removal by death of Mr. Harold Eagle, of Attercliffe Station, Ontario, who for a number of years faithfully and ably served this Association on the Board of Directors and during the years of 1898 and 1899 as President.

Mr. Eagle was instrumental in doing a great deal for the promotion of the dairying industry in the district which he represented as an officer of this Association.

That this resolution be placed in the records of this Association and a copy be forwarded to the family of the deceased.

RESOLUTIONS.

The *following resolutions were adopted*:—

"Whereas the success and educational value of this Convention and the interest taken therein is due in a marked degree to the presence of speakers who have kindly addressed our meetings, we desire to express our sincere thanks for their assistance and presence throughout the various sessions."

"That we, the members of this Association, desire to express our appreciation of the kindness of the Mayor, Board of Trade, and citizens of Brantford in furnishing the use of the Opera House, together with the excellent musical part of the programme free of charge for the Convention and Dairy Exhibition; also to the press for the excellent reports given by them of this Convention."

"That the thanks of the Convention be and are hereby tendered to the Canadian Salt Co., of Windsor, Ont., through their General Manager, Mr. E. G. Henderson, for the very handsome badges presented by the company to the Association."

"That the thanks of the members of this Association be and are hereby tendered to the *Heller & Merz Co.*, New York; The *R. M. Ballantyne Co.*, Limited, Stratford; C. H. Slawson & Co., Ingersoll; J. B. Ford Co., Wyandotte, Mich.; The Canadian Salt Co., Windsor; The Western Salt Co., Mooretown; Ryrie Bros., Toronto; for the special prizes kindly donated for our Dairy Exhibition."

"That we *feel as Dairymen we are under great obligations to the Ontario* Department of Agriculture for the assistance they have rendered the Dairy industry, through the system of instruction that has been given, and also in providing speakers to attend annual meetings of cheese factories and creameries."

"That we wish *to* express *our appreciation of the* work *of* Hon. Nelson Monteith while Minister of Agriculture for Ontario, and extend to him our very best wishes for the future."

"That we, as dairymen, believing that the work of cow testing Associations is conducive to increased production, wish to express to the Hon. Sydney Fisher, *Minister of Agriculture for Canada, our* appreciation *of this* work, and would humbly suggest that it be continued."

The Convention then adjourned.

APPENDIX.

THE MANUFACTURE OF WHEY BUTTER.

The making of butter from the fat left in whey, the by-product in the manufacture of cheese, has received more or less attention from dairymen during the past two or three years, and it was thought well by this Department to have experiments conducted therein, under factory conditions, during the season of 1908. We have pleasure in presenting herewith the reports submitted by the persons who conducted these experiments.

In estimating the probable profits in the manufacture of whey butter, the producers should not lose sight of the fact that whey from which the fat has been extracted is much less valuable for feeding purposes than the whey in which the fat is retained.

In the 1908 Report of the Agricultural College, page 147, will be found results of experiments conducted by Pro. G. E. Day, in the feeding of ordinary whey and meal as compared with separated whey and meal. The difference in results indicated that 1,000 pounds whey in which the fat has been retained is worth 43.7 cents more than the same quantity of whey from which the fat has been extracted. When both the cost of manufacture and the feeding value of the fat in the whey are considered, butter would require to bring more than the average price during the past few years in order that the manufacture of whey butter could be carried on at a profit.

It must be remembered that the whey as usually delivered to the farmer does not contain all the fat which was in it when taken fresh from the vats. In unpasteurized whey a good deal of this fat is left in the tanks at the factory. Where the whey is pasteurized, the fat remains equally distributed in the whey and therefore renders it of much greater value for feeding purposes. For particulars as to the methods of pasteurizing whey, we would direct the readers to the report of Mr. Frank Herns, as given in this volume. It must be remembered that Prof. Day conducted only one experiment in which comparison of separated and ordinary whey was made, and Prof. Day is inclined to the opinion that the fat retained in the whey would not always show such a high feeding value. He is convinced however, that in the past too low an estimate has been placed upon the value of the fat contained in the whey for feeding purposes.

We would ask the farmers and manufacturers to consider very carefully the reports presented herewith, as as well as the experiments conducted by Prof. Day, before deciding to install equipment for the manufacture of whey butter.

EXPERIMENTS CONDUCTED AT THE KERWOOD CHEESE AND BUTTER FACTORY.

BY FRANK HERNS, CHIEF DAIRY INSTRUCTOR FOR WESTERN ONTARIO.

The work was begun on May 15th, and continued each day throughout the season. The Kerwood factory makes butter the whole year, and both cheese and butter for from six to eight months. It is well equipped and well managed. Ejectors, and piping and other necessary equipment was put in, so that the whey could be ejected from the cheese vat into the milk receiving vat and then pumped into the tempering pan from which it ran to the separators. In the morning the two or three separators were started, and the milk that was to be used for butter making was skimmed, while that which was to be made into cheese was conducted to the cheese vat and the process proceeded with. By the time the milk was skimmed and the separator stopped and washed, some of the whey was ready to draw off the cheese vats. The separators were then started again and the whey skimmed, allowing it to pass into the whey tank. By ejecting the whey from the cheese vats to the receiving vat it raised the temperature to about 128 degrees for skimming. The DeLaval Separator Company very kindly loaned a special top cover for one machine which had a large feed tube, allowing from 4,000 to 4,500 lbs. of whey to flow through the bowl per hour. A small hand churn was used for churning and a lever worker for working the butter.

Records were kept and tests made each day. Different methods were tried. Sample boxes of butter were placed in cold storage and scored by experts from time to time to find out its keeping and general qualities. Samples of finest creamery butter made the same date were placed in storage beside the whey butter for comparison and also to find out if possible if the whey butter went off in flavor in less time than creamery butter. Samples of whey and creamery butter were also stored in an ordinary storage at comparatively high temperature to find out the effect of such storing and to compare the two butters as to general conditions when treated in this way. Records were kept to find out the average loss of fat in the whey when ready to run off the curd, and to find how much whey butter could be made on an average from 1,000 lbs. of whey; also to find out if possible the best system to practice for ripening and churning whey cream, if a high or low per cent. of fat in the cream, if a high or low temperature for churning and washing was preferable; also if the cream should be ripened naturally or with culture or whether it should be ripened at all, or if better butter could be made by churning the cream sweet and at low temperature with culture added just before churning. Pasteurizing the cream was also tried with good results.

We wished to find out the loss of fat in the butter milk under different conditions, the per cent. of over-run and the per cent. of moisture in the butter, the effect of cheese color on the butter, the cost of making a pound of butter and the general quality, and how such butter would sell among the patrons and on the open market.

It was impossible to skim all the whey at all times, since no storage tank could be provided, and if the curd was taking on acid very fast the whey might have to be drawn faster than it could be skimmed, so that occasionally some of the whey was allowed to run into the tank without being skimmed.

The total number of pounds of milk used during the time the experiments were carried on and made into cheese was 945,492 lbs., or about 7,800 lbs. per day. The average per cent. of fat in milk for the month of June was 3.24 per cent.; for July, 3.33 per cent.; for August, 3.5 per cent.; for September, 3.64 per cent. The average for the four months was 3.43 per cent.

(The Dairy Instructors made 395 tests during the season of six months covering all the cheese factories in Western Ontario for the per cent. of fat in the milk in the vats, and the average of their test was 3.5 per cent.) The estimated pounds of whey skimmed was 826,406 lbs. This is probably not accurate, since there was no way of weighing each day the amount of whey skimmed. The average number of pounds of whey skimmed in June per day was 5,720 lbs., in July 8,497 lbs., in August, 8,947 lbs., in September, 8,062 lbs., or an average per day for the four months of 7,800 about.

Loss of Fat in Whey: The average mechanical loss in the whey when ready to run off the curd was found to be for the four months, .241 per cent. It was as high as .33 per cent. and as low as .15 per cent. The average loss in June, .254 per cent.; for July, .245 per cent.; for August, .225 per cent.; for September, .24 per cent. The loss was usually greater when the milk was over-ripe or gassy, but not at all times. There was at times a high loss for no apparent cause, while at other times the loss was comparatively small when the milk was really in a condition that the loss should have been greater.

(Note.—From a total of 381 tests made by the Dairy Instructors in each group in Western Ontario this year representing from three to five tests at each factory the average mechanical loss of fat in the whey when ready to run off is .23 per cent., as high as .35, and as low as .15).

Skimming the Whey: The whey was ejected from the vats to the separators, skimmed at an average temperature of 128° F. An average amount of 4,100 lbs. per hour was put through each machine. By having the enlarged feed tube, 4,200 per hour could be skimmed with only a trace of loss in the skimmed whey. As high as 4,800 lbs., per hour and as low as 3,000 lbs. per hour was tried. The average loss of fat in the whey for the four months after being skimmed was .026 per cent., as high as .03, and as low as .01. With the enlarged feed tube 20th Century machine, 4,100 to 4,200 lbs. of whey per hour could be skimmed with only a slight trace of loss of fat in the skimmed whey, at a temperature of 128° F.

The Whey Cream: Cream from 27 per cent. to 63 per cent. was skimmed, a total of 3,312.9 lbs., testing on an average of 44.2 per cent. (Note.—It might be difficult to skim a 60 per cent. cream with some separators, particularly if the whey was at all cold, say less than 120 degrees). We did not try skimming with any other separator except the DeLaval.

Pasteurizing the Cream: This in a number of cases improved the butter both in flavor and keeping quality. In a few cases it did not, but the general conclusion was that pasteurizing the cream and cooling at once was an advantage so far as the quality of the butter was concerned.

Ripening and Churning the Cream: These conclusions were reached from the work done so far: 1st. The richer the cream up to 60 per cent. the better flavored the butter and the better the body and texture. 2nd. Thin cream takes on acid rapidly and tends to affect unfavorably the flavor of the whey butter. 3rd. Leaving the cream at a high temperature for any length of time after skimming affected unfavorably the flavor of the whey butter. 4th. Allowing the cream to ripen or develop much acid either naturally or by the addition of culture long enough before churning that much

acid would develop, affected unfavorably the flavor of the whey butter. 5th. Allowing the whey to stand very long before skimming or to develop much acid affected unfavorably both the flavor and the color of the whey butter.

The work done this year points to skimming a rich cream, pasteurize the cream if possible, cool at once to a low temperature 40° to 48° F., depending on conditions for churning. Hold at a low temperature over night or until such time as the fat is thoroughly firmed (5 hours at least), then add 20 to 25 per cent. of good culture with an acidity of 5 per cent. to 7 per cent., and churn at once at as low a temperature as will bring the butter in the usual churning time. The whey cream if rich enough will churn in the same length of time at lower temperatures as ordinary cream and will also churn quite easily with very little acid, or comparatively sweet. Better results were obtained by keeping the cream at low temperatures and as sweet as possible up to churning time and then adding the culture. Whenever the cream was allowed to develop much acid either by the addition of culture or naturally the flavor of the butter was not so good. Holding quantities of whey before skimming or quantities of cream before churning for one or two days, and of course longer, was detrimental to the flavor of the butter. The more acid developed on the whey before skimming and on the cream before churning the poorer the flavor of the butter, and also the higher the color. Skimming the whey at once when ready to run off the vat, cooling the cream at once to a low temperature and keeping comparatively sweet until ready to churn, adding the culture just before churning, and churning at a low temperature gave the best results as to flavor, body, texture and color. The shorter the time the culture was in the cream before churning the better the results. By allowing the culture to develop in the butter rather than in the cream better results were obtained. Ripening or churning the cream at high temperature, 50° F. or above, gave poor results.

Loss of Fat in the Butter Milk: Average loss of fat in the butter milk for the four months was .83 per cent.; for June, 1.5 per cent.; for July, .7 per cent.; for August, .43 per cent.; for September, .91 per cent. The loss ran as high as 3.2 per cent. and as low as .1 per cent. Where the cream was churned at high temperatures the loss was greatest, or where ripened at high temperature, even though churned at fairly low temperature. When ripened and churned at low temperature the loss was comparatively small, provided the cream was rich in fat.

Moisture in Butter: The average moisture for the four months was 12.8 per cent.; as high as 17.05 per cent. on two occasions only, churned at 60° F., and as low as 11 per cent. fat, usually when the cream was churned at fairly high temperatures, 55° to 60° F.; the moisture content was high, although it was often high (15 per cent.) and low (11 per cent.) for no apparent reason.

Amount of Butter Made: In June, 298.5 lbs. of whey butter was made and sold for 18 cents per lb., amounting to $53.73. Finest creamery butter made in June sold for 22 cents per pound. In July, 407.5 lbs. of whey butter was made and sold for 20 cents per lb. up to July 20th, and 22 cents per lb. for balance and month, or 315.5 lbs. at 20 cents, amounting to $63; 10 and 92 lbs. at 22 cents, amounting to $20.24, making a total of $83.34. Finest creamery butter sold in July for 23.74 cents per lb. In August, 456 lbs. of whey butter was made which sold for 22 cents per lb., amounting to $100.32. Finest creamery butter sold in August for 25 cents per lb. In September, 457 lbs. of whey butter was made which sold for 22 cents per lb., amounting to $100.54. Finest creamery butter sold in September for 25 cents per lb.

The total butter made for the four months was 1,619 lbs. which sold for $337.93.

OVER-RUN: The total number of pounds of butter fat recovered for the four months was 1,420.7, the total pounds of butter made was 1,619 lbs.; the over-run therefore was 14 per cent.

June—fat, 266.5 lbs.; butter, 298.5 lbs.; over-run, 12 per cent.
July—fat, 370.7 lbs.; butter, 407.5 lbs.; over-run, 9 per cent.
Aug.—fat, 403.4 lbs.; butter, 456.1 lbs.; over-run, 13 per cent.
Sept.—fat, 380.1 lbs.; butter, 457.1 lbs.; over-run, 20 per cent

COST OF MAKING ONE POUND OF WHEY BUTTER: Under Kerwood conditions, which are probably better than some factories from the fact that all the machinery is placed and in operation every day and cheese and butter made each day, the cost of making one pound of whey butter is estimated to be 7 cents, *but there is no profit for the manufacture at this price.*

AMOUNT OF BUTTER FROM 1,000 LBS. OF WHEY: From two to two and one-half pounds of butter can be made from 1,000 lbs. of whey.

EFFECT OF CHEESE COLOR ON THE BUTTER: Cheese color affects the butter in color very little provided the whey is skimmed sweet and churned as sweet and at as low a temperature as possible. The collecting of whey or cream for two or more days has a tendency to heighten the color of whey butter. Hansen's Cheese Color to the amount of one ounce per 1,000 lbs. of milk was used. When white cheese were made in September 1-16th oz. of butter color was used in the whey cream in order to get a proper butter color.

QUALITY OF THE BUTTER: In no case was the whey butter found to be equally as perfect in flavor as the whole milk creamery butter. The whey butter has a peculiar flavor of its own, but which is not at all times in any way disagreeable. It would not all class as first grade creamery butter, but would certainly if properly made grade as first grade dairy butter, and is equal and perhaps sometimes superior to some of the rather inferior creamery butter. The character of the butter will depend almost entirely on the conditions under which it is made. It is certainly marketable butter, and as mentioned before, will compare very favorable with some of our poorer creamery butter, and is far superior to the average class of dairy butter.

KEEPING QUALITIES: The whey butter keeps very well in cold storage at 10° F.; in fact the flavor and general condition of the butter after one month, two months, three months, and four months in cold storage is practically as good as when first put in storage, allowing of course for the general depreciation of all butter at that age. Appended is a record of the scores made by experts of finest creamery butter and whey butter placed in storage at the same time, held the same length of time at the same temperatures, which will give an idea of the keeping qualities of both butters. Unless frozen it should be consumed at once, or as soon as possible after making. Some experts, commenting on the quality of the butter in storage, say it is not export butter.

THE OPINIONS OF KERWOOD PATRONS OF THE VALUE OF THIS BUTTER: 1st. They say it does not stand up in the heat as well as the creamery butter. (Note.—Holding the cream at a low temperature for a sufficient length of time and churning at a low temperature and skimming the whey at a temperature of 98 instead of 128 degrees might help this condition.) 2nd. At 3 cents per pound less in price than Kerwood creamery butter a great many of the patrons prefer whey butter. No patron would prefer to take whey butter for their own use instead of creamery butter at the same price.

Large numbers of Kerwood patrons used this whey butter all season and are still using it, and were well satisfied with the quality. There has been no dissatisfaction of the patrons in the matter of skimming the fat from the whey.

SELLING ON OPEN MARKET: Some of the whey butter was sold to one of the best grocers in the city of London, under a special brand (Crown Brand), and no difficulty was found in disposing of this butter at prices from 1 to 3 cents less than the retail price of finest creamery butter made at the same factory in which the whey butter was made. In fact the grocer affirmed that he could find a line of customers who would readily take this butter at the lower price.

STORAGE MUST BE PROVIDED: It would be absolutely necessary for cheese factories undertaking to make whey butter to provide ice for cooling the cream and also a proper storage which could be kept at a low temperature, as it would be a great mistake to send this butter out to patrons or customers without first thoroughly cooling after being churned.

It would be the height of folly to attempt to make this butter without making ample provision for a proper plant, storage tank for the whey which can be kept absolutely clean, plenty of ice cold water, and a small storage. Small sized churns and workers are best, since the cream should be churned every day, even if several factories combined, skimmed the whey and sent the cream to a central plant to be churned. Even under these conditions ice should be provided at each factory to cool the cream to a low temperature immediately after it was skimmed.

With reference to the loss of fat in the whey and the amount of butter which can be made from 1,000 lbs. of whey, the loss draining from the curds after dipping, milling, and in the press is not taken into consideration, as it is just possible that it would be difficult under practical conditions to manufacture this fat into marketable butter. The only fat therefore taken into consideration in these experiments is that which was lost in the whey up to and at the time of dipping, or drawing the whey off the curd.

Assuming that the average lost of fat in the whey in Western Ontario is .23 per cent. we would have 2.31 lbs. of fat recovered from 1,000 lbs. whey. Adding one-sixth to this would be practically .4 for over-run. We would therefore have 2.3 lbs plus .4 lbs, which would make 2.7 lbs. of butter as an average amount that can be made from 1,000 lbs, of whey, taking the whole season into consideration. There is however a small loss in skimming of about .02 per cent. or perhaps a little more, if too large a quantity of whey is run through the separator. This would equal .2 lbs. loss in 1,000 lbs. of whey. Subtracting, therefore, .2 lbs. from 2.7 lbs. would leave 2.5 lbs. of butter from 1,000 lbs. of whey. There is also a small loss of fat in the butter-milk, which would slightly reduce the amount to perhaps 2.3 lbs.

No. 1. Butter scored by I. W. Steinhoff. Was made and placed in the London Cold Storage on the dates mentioned.

Scored by I. W. Steinhoff.	Flavor, 45	Body, 25	Color, 15	Salt, 10	Style, 5	Total, 100
Creamery Butter, made June 9th, No. 1,						
Scored July 9th............................	41.5	24.5	14.5	10	5	95.5
" Oct. 17th. Same butter..............	41.5	24	14.5	10	5	95
Whey Butter, made June 9th, No. 2,						
Scored July 9th............................	41	24	14.5	10	5	94.5
" Oct. 17th. Same butter..............	40.5	23.5	14	10	5	93
Creamery Butter, made June 16th, No. 1,						
Scored July 9th............................	43	24.5	14.5	10.5	5	97
" Oct. 17th. Same butter..............	41.5	24	14	10	5	94.5
Whey Butter, made June 16th, No. 2,						
Scored, July 9th............................	42	24.5	14	10	5	95.5
" Oct. 17th. Same butter..............	40	23.5	14	10	5	93
Creamery Butter, made June 23rd, No. 1,						
Scored July 9th............................	42	34.5	14.5	10	5	96
" Oct. 17th. Same butter..............	41.5	24.5	14.5	10	5	95.5
Whey Butter, made June 23rd, No. 2,						
Scored July 9th............................	40	23.5	13.5	10	5	92
" Oct. 17th. Same butter..............	41	23.5	13	10	5	92.5
Creamery Butter, made June 30th, No. 1,						
Scored July 9th............................	40.5	24	14	10	5	94.5
" Oct. 17th. Same butter..............	42.5	24	14.5	10	5	96
Whey Butter, made June 30th, No. 2 (*a*), 5% of sugar added,						
Scored July 9th............................	42.5	24	15	10	5	94.5
" Oct. 17th. Same butter..............	41.5	24	14	10	5	94.5
Whey Butter, made June 30th, No. 2, (b) same as No. 2 (*a*), but no sugar added,						
Scored July 9th............................	40	24	15	10	5	94
" Oct. 17th. Same butter..............	42	34	14	10	5	95
Creamery Butter, made July 8th, No. 1,						
Creamery Prints, scored July 9th..............	42	24.5	14.5	10	5	95
" " " Oct. 17th. Same butter.	41	24	14.5	10	5	94.5
Whey Butter, made July 8th, No. 2,						
Whey Prints, scored July 9th	39.5	24	14.5	10	5	92.5
" " " Oct. 17th. Same butter..	40	23	14	10	5	92
Whey Prints Pasteurized, made July 9th, Scored Oct. 17th............................	40.5	23.5	14.5	10	5	93.5
Whey Butter Pasteurized, made July 12th, 1 quarter of 1% of borax added and 5% sugar Scored Oct. 17th............................	41.5	24	14	10	5	94.5
Whey Butter Pasteurized, made July 12th. No preservative added, Scored Oct. 17th............................	40.5	24	14	10	5	93.5
Whey Butter Pasteurized, made July 14th, Scored Oct. 17th............................	38	24	14	10	5	91.5
Same butter, made July 14th, not pasteurized. Scored Oct. 17th............................	40	24	14	10	5	93
Whey butter, not pasteurized, made July 31st. Scored Oct. 17th............................	39	24.5	14	10	5	92.5
Same butter, pasteurized and ¼ of 1% Boracic acid added. Scored Oct. 17th	40	24.5	15.5	10	5	94

No. 2. Scored by J. B. Muir. Was made and placed in the London Cold Storage on the dates mentioned. With the exceptions of the last four packages, this is the same butter scored by Mr. Steinhoff.

Scored by J. B. Muir.	Flavor, 45	Body, 25	Color, 15	Salt, 10	Style, 5	Total, 100
Creamery Butter, made June 9, No. 1,						
Scored August 15th	43	24.5	14.5	10	5	97.5
" October 31st. Same butter	41.5	24	14.5	9	5	94
Whey Butter, made June 9th, No. 2,						
Scored August 15th	41.5	24	14	10	5	93.5
" October 31st. Same butter	39	23	14.5	9	5	90.5
Butter, made June 16th, Creamery No. 1,						
Scored August 15th	43	24.5	15	9	5	96.5
" October 31st. Same butter	42	24	14	9.5	5	94.5
Whey Butter, made June 16th, No. 2,						
Scored August 15th	41	24	14.5	10	5	94.5
" October 31st. Same butter	40.5	24	14	9.5	5	93
Creamery Butter, made June 23rd, No. 1,						
Scored August 15th	43.5	24.5	15	9.5	5	97.5
" October 31st. Same butter	42	24	15	9.5	5	95.5
Whey Butter, made June 23rd, No. 2,						
Scored August 15th	40.5	24	14	9	5	92.5
" October 31st. Same butter	41	24	14	9	5	93
Creamery Butter, made June 30th, No. 1,						
Scored August 15th	43.5	25	15	9	5	98
" October 31st. Same butter	41.5	24	14.5	9.5	5	94.5
Whey Butter, made June 30th, No. 2 (*a*),						
Scored August 15th, 5% sugar added	37	24	14	9.5	5	89.5
" October 31st. Same butter	37.5	23	14.5	9	5	90
Whey Butter, made June 30th, No. 2 (*b*), same as No. 2 (*a*), but no sugar added,						
Scored August 15th	40	24	14	9	5	92
" October 31st. Same butter	39.5	23 5	14	9	5	91
Creamery Prints, made July 8th, No. 1,						
Scored August 15th	41	24	15	10	5	95
" October 31st. Same butter	41.5	24.5	14.5	9	5	94.5
Whey Butter, Prints, made July 8th, No. 2,						
Scored August 15th	39.5	23.5	14	9.5	5	91.5
" October 31st. Same butter	40	23.5	13.5	9.5	5	91.5
Whey Prints, pasteurized, made July 9th,						
Scored October 31st	40	24	14	9.5	5	92.5
Whey Butter, pasteurized, made July 12th, 1 quarter of 1% borax added and 5% sugar,						
Scored August 15th	40.5	23	13	9	5	90.5
" October 31st	40.0	24	14	9	5	92
Whey Butter, pasteurized, made July 12th, no preservative added,						
Scored August 15th	39	24	14	9.5	5	91.5
" October 31st	41.5	24.5	14.5	10	5	95.5
Whey Butter, pasteurized, made July 14th,						
Scored August 15th	38	24	13.5	10	5	90.5
" October 31st. Same butter	40	24	14.5	9.5	5	93

No. 2. Scored by J. B. Muir. Was made and placed in the London Cold Storage on the dates mentioned.

Scored by J. B. Muir.	Flavor, 45	Body, 25	Color, 15	Salt, 10	Style, 5	Total, 100
Whey Butter, same as above, but not pasteurized,						
Scored August 15th	37.5	24	13.5	9	5	89
" October 31st. Same butter	39	23.5	13.5	9	5	90
Whey butter, not pasteurized, made July 31st.						
Scored August 15th	36	23.5	14	10	5	88.5
" October 31st	37.5	24	13.5	10	5	90
Whey Butter, same as above, but pasteurized, ⅛ of 1% boracic acid added,						
Scored August 15th	40	23.5	14	9	5	91.5
" October 31st	40.5	24	14.5	9.5	5	93.5
Creamery Prints, made July 31st, placed in Kerwood storage at a temperature of from 40° to 55° up, until September 25th, when they were removed to London storage and placed at a temperature of 10 degrees,						
Scored October 31st	35	23.5	14	9.5	5	87
Whey Prints, made July 31st, placed in Kerwood storage at a temperature of from 40° to 55° up, until September 25th, when they were removed to London storage and placed at a temperature of 10 degrees.						
Scored October 31st	39.5	24	14.5	9.5	5	92.5
Whey Butter, made October 3rd,						
Scored October 31st	39	24	14.5	9.5	5	92
Whey Butter, made October 6th,						
Scored October 31st	39.5	24	14.5	9.5	5	92.5

No. 3. Butter made and stored in the Kerwood Storage at temperature ranging from 48° to 55°. Scored by W. Waddell and F. Herns.

Creamery Prints, made July 22nd,						
Scored on August 22nd, by W. Waddell	38	23.5	14.5	10	5	91
" " September 23rd, by F. Herns	37	23	14.5	10	5	89.5
Whey Prints, made July 22nd,						
Scored on August 22nd, by W. Waddell	36	23	15	10	5	89
" " September 23rd, by F. Herns	37	23	14	10	5	89
Whey Butter, made July 30th, 5% sugar added,						
Scored August 22nd, by W. Waddell	28	23	15	10	5	91
" September 23rd, by F. Herns	37	23	14.5	10	5	89.5
Whey Butter, made July 30th,						
Scored August 22nd, by W. Waddell	40	23.5	15	10	5	93.5
" September 23rd, by F. Herns	39	23	14.5	10	5	91.5
Whey Butter, made July 31st, ⅛ of 1% borax added,						
Scored August 22nd, W. Waddell	39	22.5	15	10	5	91.5
" September 23rd, F. Herns	38	23	14.5	10	5	90.5
Whey Butter, made July 31st, no preservative,						
Scored August 22nd, by W. Waddell	40	23	14.5	10	5	92.5
" September 23rd, by F. Herns	37	23	14.5	10	5	89.5

No. 3.—Butter made and stored in the Kerwood Storage.—*Continued.*

	Flavor, 45	Body, 25	Color, 15	Salt, 10	Style, 5	Total, 100
Whey Butter, made August 1st, ¼ of 1% boracic acid added,						
Scored August 22nd, W. Waddell............	41	23.5	15	10	5	94.5
" September 23rd, F. Herns.......	38	23	14	10	5	90
Whey Butter, made August 1st,						
Scored August 22nd, W. Waddell	41.5	23	15	10	5	94.5
" September 23rd, F. Herns............	38.5	23	15.5	10	5	91
Whey Butter, made August 3rd, ½ of 1% saltpetre and 5% sugar,						
Scored August 22nd, W. Waddell	38	22.5	14.5	10	5	90
" September 23rd, F. Herns............	37	23	14	10	5	89
Whey Butter, made August 3rd,						
Scored August 22nd, W. Waddell............	40	23	15	10	5	93
" September 23rd, F. Herns............	38	23	14	10	5	90
Whey Butter, made August 20th, pasteurized, Scored September 23rd, F. Herns............	38	23	14	9	5	89
Same Butter, August 30th, not pasteurized, Scored September 23rd, F. Herns............	38	23	14	9	5	89

EXPERIMENTS IN THE MAKING OF BUTTER FROM WHEY.

By J. W. Mitchell, Supt. Eastern Dairy School, Kingston.

In accordance with instructions from the Department we undertook, in June last, experimental work in the manufacture of butter from whey under regular cheese-factory conditions. For this purpose two factories, somewhat widely separated from each other, were selected, namely, Balderson in the Perth District, and Harrowsmith in the Kingston District.

We felt, from the beginning, that the two chief points to be considered, and as fully solved as possible, were:

1. Yield, cost of manufacturing and the resultant profit.
2. Quality of product.

As these, in themselves, and other problems associated with them demanded a large amount of detailed information we felt it necessary to prepare a suitable report form. The accompanying is a copy of the form used in the work throughout the season, a report being made out for each day's work. This form proved very satisfactory, and enabled us to keep a complete record of the work done from day to day. It is from the daily reports sent in on this form that most of the data and statements in this report are taken. Such other work was done, and a record kept of it, as was found necessary to supplement the information obtained from the regular reports.

We purpose summarizing in tabulated form the data furnished in the daily reports, and making notes and explanations and drawing such conclusions as seem warranted. In this way the reader will be enabled to examine the data for himself and draw his own conclusions, instead of being forced to accept mere statements.

I.—Yield, Cost of Manufacturing and Resultant Profit.

These will of course be largely influenced by such conditions as the percentage of fat in the whey from the vats, the proportion of fat recovered from the whey in the process of separating, the quality of milk received, the cost of fuel, etc. In this connection the following tables and data should prove of interest and value:—

Table 1.

Month.	Wt. of Milk, lbs.	Wt. of Whey (80% of Milk).	Per cent. of Fat in Whey.		Lbs. of Fat in Cream.	Lbs. of Butter.
			From Vats.	From Sep.		
Balderson.						
June......	282,118	225,694	.193	.038	351.0	447
July......	348,712	278,969	.225	.027	553.2	710
Aug	321,269	257,015	.265	.02	627.6	861
Sept......	210,355	168,284	.302	.02	474.0	633
Oct.	179,646	143,716	.35	.015	486.1	615
Harrowsmith.						
June......	278,278	222,622	.155	.034	269.7	282
July......	353,236	282,588	.158	.025	374.8	397
Aug	454,087	363,269	.182	.026	568.1	605
Sept.......	425,225	340,180	.167	.023	489.9	547

Table 2.

Month.	Wt. of Milk, lbs.	Wt. of Whey lbs.	Wt. Cream lbs.	% of Fat in cream	Lbs. Fat in cream	Lbs. Butter.	Yield of Butter per ton of milk	Yield of Butter per ton of whey
Balderson.								
June	282,118	225,694	835	42.0	351	447	3.1	3.9
July......	348,712	278,969	1,164	47.5	553	710	4.0	5.1
Aug.	321,269	257,015	1,220	51.4	627	861	5.3	6.7
Sept......	210,355	168,284	961	49.3	474	633	6.0	7.5
Oct.......	179,646	143,716	1,061	45.8	486	615	6.8	8.5
	1,342,100					3,266		
Average ..							4.8	6.0
Harrowsmith...								
June	278,278	222,622	1,297	20.8	269	282	2.0	2.5
July......	353,236	282,588	1,370	27.3	374	397	2.2	2.8
Aug......	454,087	363,269	1,400	40.5	568	605	2.7	3.3
Sept......	425,225	340,180	1,187	41.2	490	547	2.6	3.2
Total.....	1,510,826					1,831		
Average ..							2.4	3.0

Cost of Fuel.

Experiments were made at Balderson to determine the fuel cost of elevating the whey from the vats and running the separators. A pump was used most of the time for elevating the whey and steam turbine separators for separating. A good quality of wood, composed principally of elm and poplar, in about equal quantities, was used as fuel. This wood cost $2.75 per cord of 128 cubic feet. The following table gives the results of these tests:—

Table 3.

Fuel cost of elevating and separating whey.

Wt. of Milk.	Wt. of Whey	Wood consumed (c. ft.)	Cost per ton of Milk.	Cost per ton of Whey.	Cost per lb. Butter—6 lbs. to ton of Whey.
lbs.	lbs.		cts.	cts.	cts.
11,033	8,826	12	4.7	5.9	.98
11,405	9,124	12	4.5	5.6	.93
11,029	8,823	12	4.7	5.9	.98
11,103	8,882	12	4.7	5.9	.98
20,140	16,112	24	5.1	6.4	1.06
Average	....	....	4.8	6.	1.

Notes.—(1) Price of wood taken at $2.75 per cord of 128 c. ft.
(2) The fire and steam pressure and the amount of water in the *boiler* were left practically the same at the close of the run as at the beginning.

On different occasions we ran our separators in the Dairy School with a view to determining the fuel cost of elevating and separating the whey, using coal as our fuel. Each test extended over a period of three hours. We used a pump for elevating and steam turbine separators for separating. The amount of water in the boiler, the steam pressure and the fire were left practically the same at the close as they were at the beginning of the test. Soft coal slack, at $4 per ton, was used as fuel. The fuel cost of elevating and separating was about 4½ cents per ton of whey. If we take 6 lbs. as an average yield of butter per ton of whey the cost, per pound of butter, for *fuel for elevating and separating the whey would be about ¾c. per lb. of* butter—say 1c. per lb. of butter if we allow a greater cost for the coal at *factory points than at the school.*

We are now in a position to make the following estimate, for the months of June to October, inclusive, for the Balderson factory, whose yield per ton of whey is probably a fairly representative one:—

Revenue:—

3,266 lbs. butter at 20c.		$653 20
Expenditure:—		
Cost of fuel for elevating and separating 537 tons of whey at 6c.	$32 22	
Wages of extra man at $50 per month for five months	250 00	
Interest on investment and allowance for deterioration	100 00	
		$382 22
Profit or net revenue		$270 98

Note: (1) It is important that sufficient and suitable help be engaged for this extra work, hence the allowance of $50 per month.
(2) In making the foregoing estimate, instead of making use of the prices received for butter during the past season we thought it safer to base our calculations upon what might be regarded as a more normal price, viz.: 20c. per pound.

There would be, in addition, the butter made during the months of May and November, which would swell the revenue somewhat. Hence we are safe in concluding that the making of butter from whey is a real source of

profit *in a large factory with the average loss of fat in the whey*. Of course, in the case of a factory with an unusually small loss of fat in the whey the net revenue would be reduced accordingly, possibly, in some cases, to the vanishing point.

II.—QUALITY OF PRODUCT.

Before making any thorough test of the butter for quality, including its keeping quality, we studied how best to conduct our work in the manufacturing of butter from whey.

The following notes will indicate the conditions under which the butter was made:

1. The whey was drawn from the vats into a lower vat and immediately elevated to an upper one, by means of a pump in the one factory and an ejector in the other, both of which were kept in a good sanitary condition, as were also the receptacles for the whey.
2. Separating was begun immediately.
3. A fairly rich cream was taken, as indicated in Table 2.
4. The cream was put into a can and set in water containing a plentiful supply of ice, and when cooled to 70 or 80 degrees F. a clean-flavored culture was added and the cream allowed to continue cooling to churning temperature.
5. The acidity of the cream when churned averaged slightly below .5 per cent. (5/10).
6. The churning temperature hovered around 45 degrees F., sometimes above, but more frequently below this temperature.
7. The time taken to churn was commonly 50 minutes, sometimes less, but frequently more.
8. We aimed to have the butter granules about the size of wheat grains when through churning.
9. The butter was usually washed but once with water at well temperature, (about 45° F.).
10. The common practice in working the butter was to work it twice, with a lapse of an hour to an hour and a half between workings.
11. A combined churn was used in the work.

In July we began sending butter once a week from the Balderson factory to the Ottawa Cold Storage. Each lot of butter consisted of two 14 lb. boxes, one made from whey, and the other from milk of the same day, the milk being a representative mixture taken from the several vats. The cream from the whey and that from the milk were ripened as nearly under the same conditions as possible, the same culture being used with both.

On September 24th the several lots of butter were scored by Mr. J. A. Ruddick, Dominion Dairy and Cold Storage Commissioner, and Mr. Geo. H. Barr, a member of his staff, no intimation being given them as to which was whey butter and which butter was made from milk. The following table gives the results of their scoring, *for flavor*, 45 marks being the maximum:

Date of Manufacture.	Butter from Milk	Butter from Whey
July 22nd	40	38
" 29th	41	38
Aug. 7th	42	39
" 15th	41	39
" 21st	41	38½
" 29th	42	42
Sept. 5th	41	39
" 17th	42	42½

In the latter part of September we began sending butter again from Balderson to the Ottawa Cold Storage. This second lot of butter was salted at the rate of 5/8 to 3/4 oz. per pound of butter, whereas the butter whose score appears in the foregoing table was salted more heavily to suit the local trade. This second lot was scored for flavor on November 16th by Messrs. Geo. H. Barr and J. Bouchard.

Date of Manufacture.	Butter from Milk.	Butter from Whey.
Sept. 30th..	41	38
Oct. 1st.	39	37
" 2nd..	41	36
" 3rd.	38	40½
" 5th.	42½	40
" 6th.	42	39
" 7th.	38	40
" 8th.	41	38
" 9th.	41½	39

It is perfectly evident from the two foregoing tables that the whey butter did not possess the keeping qualities of the butter made from milk. The butter was all very satisfactory as to flavor when first made.

We would add that during the season we also shipped butter from the Harrowsmith factory to the storage owned by Mr. J. Y. Parkhill, wholesale *produce merchant, Kingston, and his comment after scoring it was that* whey butter, while satisfactory as to flavor when first received, does not possess good keeping qualities. This butter was examined by Mr. G. G. Publow and the writer, and they quite agreed with these conclusions.

As the whey butter did not prove either to be possessed of as good keeping qualities as the butter made from milk, or, in the opinion of the judges, have as good a texture, we examined several samples of butter in the chemical laboratory. In this connection valuable services were rendered by our lecturer in Chemistry, Mr. W. O. Walker. The following table furnishes a number of representative results obtained:—

No. of Sample	Butter made from	Percentage of moisture in butter.	Melting point of Fat from Butter.	Iodine absorption number of fat.
{ 1	Milk	12.0	86.9°F.	37.8
{ 2	Whey	12.6	86.9°F.	37.9
{ 3	Milk	13.0	85.1°F.	37.7
{ 4	Whey	13.2	85.4°F.	37.6
{ 5	Milk	12.0		
{ 6	Whey	13.2		
{ 7	Milk	13.3		
{ 8	Whey	13.0		
{ 9	Milk	12.0	86.4°F.	36.6
{ 10	Whey	12.3	86.5	36.4
{ 11	Milk	12.0	87.6	36.5
{ 12	Whey	12.5	88.3	35.7

Notes. (1) Each pair in brackets represents butter made from milk and whey of the same day.

(2) It is to be noted that we determined the melting point of the *fat* and not of the *butter*. The method employed was that adopted by the Association of Official Agricultural Chemists, Washington. The melting point of butter-fat, according to authorities on the subject, varies from 82.5 to 91.5 degrees F.

(3) By the iodine absorption number, is meant the number of parts by weight of iodine absorbed by 100 parts by weight of fat. This number, with butter-fat, ranges from 35 to 46.

We thought it possible that the differences which manifested themselves between butter made from whey and that from milk, might be due to a difference between the relative proportions of the various fats composing the butter-fat of each, and that the melting points and iodine absorption numbers would, as a consequence, differ materially from each other. However, by a reference to the foregoing table we see that no decided difference exists between the composition of the butter-fat from milk and that from whey. Also the percentage of moisture in the two butters is much the same.

We would judge, from the results shown in the foregoing table, that the difference manifested between the two butters is not due to any difference in either the butter-fat or the moisture content. It seems to us that this difference must be accounted for in some other way, possibly by the difference in casein content, or possibly by ferments that develop more fully in the whey than in the milk. This would suggest problems for further investigation.

III. Miscellaneous Data.

A. *Distribution of Fat in Whey Tank.*

We asked for reports from a number of factories, not making whey butter, as to the percentage of fat; first, in the whey vats; second, in that drawn from the tank when about one-fourth empty, and third, that from the tank when about half to three-fourths of the whey had been drawn out. The following table furnishes the data supplied:

Test of Whey from vats.	Test of Whey drawn from tank when about a fourth empty.	Test of Whey drawn when tank was half to three-fourths empty.	Test of Whey from vats.	Test of Whey drawn from tank when about a fourth empty.	Test of Whey drawn when tank was half to three-fourths empty.
%	%	%	%	%	%
.23	.08	.15	.25	.17	.20
.28	.08	.15	.30	.15	.15
.25	.10	.25	.30	.07	.08
.30	.14	.15	.27	.13	.15
.30	.15	.16	.32	.22	.22
.27	.20	.20	.25	.14	.25
.30	.15	.15			

The whey, in the foregoing instances, was not pasteurized. It is evident that where this is not done much of the fat content of the whey rises to the surface. Furthermore, it means cans that are very hard to clean in the case of those who receive the last of the whey from the tanks, or else the loss of this fat in the draining and cleaning of the tanks, and it also means tanks that are more difficult to keep clean. It is a fair conclusion to draw, that where butter *is not manufactured from* the whey, the whey should be pasteurized, as this means an even distribution of the fat throughout the whey, sweeter whey, and cans and tanks that are easier to keep clean. Even where butter is manufactured we believe that the whey should be pasteurized.

B. *Reports from other Factories Manufacturing Whey Butter.*

Towards the close of the season we sent out report forms to several factories that were manufacturing whey butter, with the request that they be filled out and returned. The following are copies of reports received:

Month.	Lbs. of Milk.	Average % of Fat in Whey		Pounds of Butter Mfg.
		From Vat.	From Separator	
Factory No. 1:				
May	304,580	Not tested daily.	Not tested daily.	661
June	461,428			1,017
July	476,156			1,182
August	326,622			923
September	253,945			643
October	172,004			500
Factory No. 2:				
May	330,419	.24	.01	682
June	513,428	.23	.01	900
July	416,994	.23	trace	711
August	392,382	.23	.01	852
September	302,982	.21	trace	600
October	260,956	.22	.01	632
Factory No. 3:				
May	272,093	.17	trace	375
June	398,168	.19	"	558
July	428,281	.20	"	638
August	333,596	.20	"	649½
September	265,496	.25	"	636
October	199,492	.28	"	609

Note.—It is evident, from an examination of the reports given in the immediately preceding table, that the testing of the whey was not done daily, or the samples taken were not truly representative ones, or the testing was not entirely accurately done, or a correct average for the month was not obtained.

C. *Data re the Separating of Whey.*

The following table furnishes data as to the average rate per hour of separating the whey at the two factories in which our experiments were conducted:

Month.	Balderson.		Harrowsmith.	
	Rate of separating per hour, lbs.	Test of Whey from separator.	Rate of separating per hour, lbs.	Test of Whey from separator.
June	5,110	.038	4,890	.034
July	4,367	.027	3,771	.025
August	3,398	.02	3,214	.026
September	3,352	.02	3,747	.023
October	3,480	.015	....	....

At the Balderson factory the whey was separated at the temperature at which it came from the vats, or slightly below this, (94° to 98° F.), as a pump was used for elevating it, while at the Harrowsmith factory the whey, which was elevated from the cheese vats by means of an ejector, went to the separator at a much higher temperature—125° to 130° F.

The machines were run at an increased speed of fully 500 revolutions per minute.

IV. Conclusions.

1. As regards profit, it is quite conclusive that the manufacturing of butter from whey will pay in a reasonably large factory, one receiving not less than 10,000 pounds of milk per day, and having the average loss of fat in the whey.

2. However, it is not so certain that the manufacture of whey butter would prove so very profitable were the milk given the care that it should receive at the farm and skilfully manufactured into cheese. We know factories which have a very small loss of fat in the whey.

3. It is not at all likely that the manufacturing of whey butter will help to improve the quality of our cheese. On the contrary, it may injure it through encouraging carelessness on the part of the patrons and the maker.

4. It will not pay, in the case of small factories, to put in an equipment for the manufacture of whey butter. It is possible that several might combine and have one central butter plant, with separators at the different factories.

5. As to quality of product, we are forced to the conclusion that while butter of good quality *for immediate consumption* can be manufactured from whey, whey butter does not possess good keeping qualities. It is quite possible, of course, that some modification in the treatment of the cream from the whey might work an improvement in this respect.

6. To all who purpose manufacturing whey butter we would say, put in a good equipment, and by all means furnish sufficient and competent help.

In conclusion, I wish to acknowledge the valuable advice and assistance give me by Messrs. G. G. Publow, Chief Dairy Instructor for Eastern Ontario, and W. O. Walker, Lecturer in Chemistry at the School of Mining and the Eastern Dairy School. Also I would express my appreciation of the good work done by those who carried on the work at the different factories, and tender my thanks to those who so kindly examined and scored the butter for us from time to time.

COPY OF FORM USED IN RECORDING EXPERIMENTS IN THE MANUFACTURE OF WHEY BUTTER.

Experimental work in the making of buter from whey at .... cheese factory.

Separator Report.

1. Weather conditions (temp., etc.) ....
2. Condition of milk ....
3. Weight of milk, lbs. ....
4. Weight of whey (80 per cent. of wt. of milk), lbs. ....
5. Per cent. of fat in whey from vats ....Lbs. fat..........................
6. Per cent. of fat in whey from separator ....Lbs. fat..........................
7. Pounds of fat in cream, from whey ....
8. Time separator was run ....hrs..........................min..........................
9. Rate of separating per hour, lbs. ....
10. Lbs. cream from separator ....Per cent. of fat............Lbs. fat............
11. Lbs. starter used ......Per cent. starter......Per cent. of fat............Lbs. fat............
12. Lbs. cream with starter added ....Per cent. of fat............Lbs. fat............
13. Acidity of starter ....
14. Flavor of starter ....
15. Ripening temperature ....

Day of week and date of separating ....

Butter-Making Report.

16. Pasteurized or unpasteurized cream ....
17. Age of cream ....
18. Acidity of cream ....
19. Flavor of cream ....
20. Temperature of cream ....
21. Time churn was started ....
22. Time churning was completed ....
23. Length of time in churning ....
24. Amount of water added, lbs. ....Temp..........................Quality..........................
25. Weight of buttermilk, lbs. ....Test..........................Lbs. fat..........................
26. Number of times butter was washed ....
27. Temp. of wash-water ....
28. Size of granules ....
29. Condition of butter, (a) when churned ....(b) when worked..........................
30. Ounces of salt per pound of butter ....Per cent. of salt..........................
31. Kind of preservative used ....Per cent. ....
32. Number of times butter was worked ....
33. Revolutions of churn—1st working ....2nd working..........................
34. Time between workings ....
35. Lbs. butter ....Over-run (per cent.) ....Moisture (per cent.)..............
36. Pounds of butter from whey ....
37. Pounds of butter per 1,000 lbs. whey..
38. Temperature of refrigerator ....

Day of week and date of churning ....

Report by ....

Remarks: —

EASTERN DAIRY SCHOOL.

SESSION OF 1908-09.

DIRECTOR.

G. A. PUTNAM, B.S.A. Department of Agriculture, Toronto.

STAFF.

G. G. PUBLOW .... Acting Supt. and Lecturer in Cheese-Making.
J. H. ECHLIN .... Instructor in Cheese-Making.
D. J. CAMERON .... Asst. " " "
JAS. STONEHOUSE .... Instructor in Separators and Butter-Making.
J. BURO .... Asst. " " "
W. W. DOOL .... Asst. Instructor in Butter-Making.
J. F. SINGLETON .... Instructor in Milk-Testing.
J. A. CRAIG .... Instructor in Boilers, Engines and Pipe-fitting.
W. T. CONNELL, M.D., ... Lecturer in Bacteriology.
W. O. WALKER, M.A., ... Lecturer in Chemistry.

The school opened as a creamery on November 24th, 1908, and was operated as such until January 1st, 1909. From January 1st, till March 23rd, the milk was purchased by the school, and from March 23rd, till April 10th, the school was, for the convenience of the patrons, again operated as a creamery.

The total registration during the long course was sixty-one, of whom nineteen took the final examinations, both practical and written, in cheese-making, the operation of cream separators, butter-making, milk-testing, boilers, engines and pipe-fitting, as well as the written examinations in Bacteriology and Dairy Chemistry. Of these nineteen students, seventeen were successful in passing the examinations in all subjects, seven obtaining first-class honors (75 per cent. and over), seven obtaining second-class honors (60 per cent. to 75 per cent.) and three obtaining a pass (40 per cent. to 60 per cent.).

Two lectures a week were devoted to Dairy Chemistry this session, which is double the time spent on this subject in former years. The students spent considerable time in practical laboratory work and undoubtedly have a better grasp of this important subject than the students of previous classes.

The principal new feature in the matter of cheese and butter-making was the use of the Mitchell-Walker moisture test. While not enough work has been done to give out any results, some interesting information has been secured.

The milk supply during the session has perhaps been the most satisfactory during the history of the school. The quantity delivered has been very uniform from day to day and the milk has arrived earlier and in better condition than in previous years.

The Instructors' Course opened March 30th, and continued till April 9th. Twenty-five Instructors registered for this course. Practical work was carried on in the operation of separators, butter-making, milk-testing and cheese judging. Lectures were given in Dairy Chemistry, Bacteriology and Sanitation, as well as cheese and butter-making. Considerable time was devoted to the discussion of problems connected with the work of instruction which proved both interesting and profitable to those in attendance.

G. G. PUBLOW,
Acting Superintendent.

THE DAIRY SCHOOL IN CONNECTION WITH THE ONTARIO AGRICULTURAL COLLEGE, GUELPH, 1909.

LECTURERS AND INSTRUCTORS, 1909.

H. H. DEAN, B.S.A. ..Professor Dairy Husbandry.
R. HARCOURT, B.S.A. .. " " Chemistry.
H. L. FULMER, B.S.A. Demonstrator Dairy Chemistry.
S. F. EDWARDS, M.Sc. Prof. Dairy Bacteriology.
D. H. JONES, B.S.A. ...Lecturer Dairy Bacteriology.
A. McKAY ....Chief Instructor Cheese-Making.
C H. RALPH............... Assistant Instructor Cheese-making.
R. W. STRATTON .... Instructor Hand and Power Cream Separators.
F. DEAN ....Instructor Butter-making.
GEO. R. TAYLOR ....Instructor Milk and Cream Testing.
MISS LAURA ROSE ....Instructress Butter-making and Farm Dairy Cheese-making.
M. ROBERTSON ....Instructor in Hand Separators and Milk Testing, Farm Dairy.
GEO. TRAVIS .... Instructor in Boilers, Engine, Piping, Soldering, etc.
F. G. RICE ....(Graduate Midland Dairy School, Eng.) Instructor in Soft and Fancy Cheese-making.

There were three short dairy courses held at the Ontario Agricultural College between January 2nd and April 10th, 1909. Our regular course of twelve weeks took place during January, February and March, which was attended by 47 students, of whom 31 wrote on the final examinations and passed. In addition to these about 25 short course girls from the Macdonald Institute took instructions in the theory and practice of dairying in the Farm Dairy. The week course for Instructors, and for those wishing instruction in milk and cream testing was attended by 23 students, some of whom had taken the twelve weeks course previously. The total registration for the short courses was 70, not including the girls from Macdonald Institute, nor a number who dropped in for a day or two during the term.

One of the older makers who was here for about two weeks thought it would be a good plan to have it generally known that cheese and butter makers may come to the Dairy School at any time during the course and pick up any information which may be available. This has always been understood to be the case, but to make it more clear, we extend to all cheese and buttermakers a hearty invitation to come to the Dairy School at any time; attend what lectures they see fit; ask all the questions they like; take up any special line to practical work in which they are interested—in a word, to make use of the lecturers, instructors, and equipment of the School to the fullest extent possible. *We much prefer those who come and take the regular three* months' course, but if this is not practicable, makers are welcome at any time to avail themselves of what information we may possess.

In view of the recent legislation requiring all head cheese and buttermakers to have Dairy School Certificates, or permits, after January 1st, 1911, we think it advisable that uniform certificates shall be issued by both Dairy Schools, and we have so recommended. It is altogether likely that the legislation referred to will cause an increased attendance at the Dairy Schools. Means will have to be provided before long to increase the building and equipment of the Dairy School at Guelph. The original dairy building is now used for cheese instruction and farm dairy work. In this building are located our steam boilers. As the building is one of the oldest on the College campus, it is almost beyond repair. The other building was erected in 1893 and is still in a fairly good state of repair. The lecture, coat and cloak rooms, office, milk-testing and creamery rooms are in this building. A

hand separator room and a laboratory for advanced students were fitted up in what was the live-stock class room. The live-stock lectures were given to the dairy classes in the pavilion of the College during the session of 1909.

A one month's course in soft cheesemaking was added to the regular course this year. This instruction was given during the month of February. We hope to be able to repeat this in 1910, as there seems to be a market for a limited amount of soft cheese at very profitable prices.

Dr. C. E. Thom, of the U.S. Department of Agriculture, who delivered an excellent lecture to the Instructors' and milk and cream testing classes on April 8th, said that he did not see how farmers could profitably patronize "hard cheese" factories. He pointed out that in the New England States there are practically no hard cheese factories now in operation except in one corner of the State of New York. His contention was that there is nothing in it for the milk producer, who does not realize more than the average price paid for milk at Cheddar cheeseries. This conviction is growing among our progressive, up-to-date farmers, and they are beginning to ask themselves what they can do as a substitute. In some sections they are patronizing milk condenseries; in others they are shipping milk or cream to towns and cities. How to make dairying more profitable to the man on the farm is one of the great problems which Dairy Schools and others must grapple with in the near future if the dairy business is to continue a prominent feature of agricultural operations in the Province of Ontario. The manufacture of the finest hard cheese with the least waste of food materials furnished in milk; the making of fine butter at least cost; the proper distribution of proceeds among patrons, together with investigations relating to such branches as milk condensing, whey butter, soft cheesemaking, etc., as possible additional sources of revenue to dairymen—all these are questions for Dairy Schools and dairy scientists to wrestle with.

It is the opinion of our Instructors that it would be wise in future to require of all students who expect to complete the full course, that they shall take up the full course of work instead of being allowed to select optional subjects as has been the case in the past. At their last meeting in 1909, the Instructors recommended that these optional courses be no longer allowed, and this recommendation will likely be adopted for the term of 1910.

In order to improve the business methods followed in creameries and cheeseries, and to get a set of books which shall be better adapted, more particularly for cream-gathering creameries, one session of the Instructors' Course was devoted to a discussion of these subjects. A committee composed of Messrs. Herns, Stratton and Robertson was appointed to look into the question and report at some future meeting.

On the whole, the Dairy Courses of 1909 were well attended, and the interest of the classes good, but we sometimes feel as if we were not getting at the men who would be most benefited by a course in the Dairy School. We trust that in the future we shall see an improvement in this respect.

H. H. Dean,
Prof. Dairy Husbandry.

CONSTITUTION AND BY-LAWS.

THE DAIRYMEN'S ASSOCIATION OF WESTERN ONTARIO.

Preamble.

This Association shall be known as the Dairymen's Association of Western Ontario, ınd shall have for its object the furthering of the interests of the dairy industry of Vestern Ontario.

(a) By holding an Annual Convention.

(b) By co-operating with dairymen in various sections, holding local dairy meetings, ending speakers to annual meetings, collecting, arranging and sending out to dairymen ıseful information.

(c) By co-operating in promoting the educational work of the Department of Agriulture of Ontario.

(d) By such other means as may be approved by the Minister of Agriculture.

(e) The Association year shall be the calendar year.

Constitution.

1. Membership in the Association shall consist of annual subscribers and the memership fee shall be decided by by-law.

2. This Association shall hold an annual meeting at such time and place as may be etermined by by-law.

3. At such annual meeting a Board of Directors shall be elected, the number of irectors, their representation of certain districts and their mode of selection being etermined by by-law.

4. The members may elect as director a person not a member of the Association, ut the person so elected must within ten days become a member, and he shall be ntitled to act as director only after he has become a member of the Association.

5. The directors shall from among themselves elect a President and one or more ice-Presidents.

6. The directors shall from among themselves or otherwise elect a Secretary and reasurer or a Secretary-Treasurer.

7. The Board of Directors shall elect from among themselves an Executive Comittee to consist of five members. The members of any Committee shall have power to ld to their number when by so doing better work may be accomplished.

8. The Executive Committee shall have the right to conduct such business of the ssociation as the directors may specify, carry into effect the plan of work decided upon the directors, and shall approve of accounts when necessary, plan and carry into fect such lines of work as may be beneficial to the Association and not of sufficient ıportance to justify the calling of the whole board together.

9. At each annual meeting the retiring officers shall present a full report of their oceedings and of the proceedings of the Association, a detailed statement of receipts ıd expenditures for the previous year and of the assets and liabilities duly audited; copy of the said report, a statement of the receipts and expenditurs, a statement of e assets and liabilities, a list of the members and a list of the officers elected, and so such general information on matters of special interest that such Association has en able to obtain shall be sent to the Minister of Agriculture within forty days after e holding of such annual meeting.

10. The directors shall have full power to act for and on behalf of the Association, d all grants of money and other funds of the Association shall be received and pended under their direction subject nevertheless to the by-laws and regulations of the sociation.

11. The constitution and by-laws of this Association must be approved by the Minis- of Agriculture, and any change, alteration, or repeal of the same must be submitted and approved by the Minister before it shall have force or effect.

12. Except as otherwise provided a vacancy occuring by the death or resignation or lure to qualify as member of any officer or director may be filled by the remaining icers of the Association; and it shall be the duty of such officers, and they are hereby powered, to nominate and appoint a fit and proper person to fill the office for the

unexpired term of the person so dying or resigning; but in the event of the remaining officers being insufficient to form a quorum, or if, for any reason, a quorum cannot be obtained, then persons to fill the vacant offices shall be elected in the manner hereinafter provided.

13. In the event of an election of any directors of this Association being held at the time or place directed by by-law or being for any reason illegal and void, then the persons in office at the time when such officers or directors should have been elected shall continue to be, and shall be deemed to be the officers of such Association until their successors are legally appointed.

14. In the event of any such non-electing or illegal election a special meeting of the members of such Association shall be called as soon as practicable for the election of such directors. Such meeting to be called (in the manner provided by the by-laws of this Association for calling of annual meetings) by the President, or, in his absence or on his neglect by the Vice-President, or in the absence or on the neglect of the President and Vice-President, then by any three members of the Association, and at such meeting the election of officers shall take place and the persons elected shall thenceforth, until their successors are appointed, be and be deemed to be the officers of such Association.

By-laws.

1. The annual membership fee of this Association shall be one dollar or such sums as shall be determined by the Board of Directors from time to time.

Any person may become a member by giving or sending his name and address to the Secretary-Treasurer accompanied by such annual fee, and each member shall be entitled to a free copy of any publication issued by this Association in the year in which he is a member, and his name and address shall be forwarded to the Department of Agriculture for the receipt of the various publications sent out free from the said Department.

2. Each member shall annually upon payment of his annual subscription be supplied with a badge bearing the year of its issue thereon, which he shall wear when attending the annual meeting of the Association, and only those wearing badges for the year shall be entitled to vote.

3. The officers of this Association shall consist of a President, 1st Vice-President, 2nd Vice-President, 3rd Vice-President, Secretary-Treasurer and Directors.

4. This Association shall hold an annual meeting or such other meetings each year on such day or days at such place or places as may be decided upon by a majority vote of directors at any regular meeting of such directors.

5.—(*a*) At the annual meeting each year the directors, two auditors, and representatives from this Association to such Fair Associations and to such other organizations as may request representatives or to such other organizations as the members present at such annual meeting may decide upon to send representatives to, shall be elected by a majority vote of the members present in the manner hereinafter provided.

(*b*) One director shall be elected for each group of cheese factories and creameries, as grouped for instruction during the preceding year, and he shall reside in or near the group which he may represent, and may be called on by representatives of the Department of Agriculture to visit such cheese factories or creameries in the group which he represents, that may be found in an unsanitary condition.

(*c*) The Board of Directors shall always consist of ten members, provided, however, in case of there being less than ten groups of cheese factories and creameries in any year preceding the meeting at which election is held, then an additional number of directors sufficient to make up the required number of directors shall be elected, as hereinafter provided. No director so elected shall reside at or near the same place as any other director and no group shall have more than two directors during any year.

(*d*) At each annual meeting a nominating committee shall be appointed by a majority of the members present, who shall submit a report to such annual meetings, with such names as they may consider suitable for the offices of directors, auditors and representatives, and such report may be adopted by majority vote of the members present. Provided, however, that the report of the nominating committee may be amended and other name or names substituted for those in the nominating committee's report, and such amendment to be adopted only by majority vote of members present.

Duties of Officers.

1. The President shall preside at all meetings of the Association, Board of Directors and Executive Committees, and decide all questions of order, and make suggestions as he may deem necessary in the interest of the Association, and shall be *ex-officio* member of all committees.

2. It shall be the duty of the Vice-Presidents to aid and assist the President, and in his absence the powers and duties of the President shall devolve upon the first Vice-President, if the first Vice-President is also absent they shall devolve upon the second Vice-President, and if the second Vice-President is also absent they shall devolve upon the third Vice-President.

3. The President, Vice-Presidents, Secretary-Treasurer and Directors only are officers.

4. It shall be the duty of the Secretary-Treasurer to attend all meetings of the Association, the Board of Directors, and the Executive Committees to keep correct minutes of the same, furnish certificates of membership, notify all the directors of every regular meeting also special meetings of the Board, conduct all correspondence, issue all press and other reports, and prepare for publication the annual report, present at each annual meeting a full report of the previous year's proceedings of the Association, as well as a list of the members and officers elected, together with such general information on matters of special interest to dairymen as the Association may have obtained, and perform such other duties appertaining to his office as Secretary and as may be required by the Board or any provisions of Chapter 17, Statutes of Ontario, 1906, or any amendments thereto, and as Secretary-Treasurer shall be *ex-officio* member of all committees of this Association, and shall be the *ex-officio* Secretary of the said committees.

As Treasurer he shall receive and account for all moneys belonging to the Association, pay all bills and accounts, that have been approved of by the Board of Directors or the Executive Committee, and shall before entering upon the duties of his office give, if necessary, a bond which shall be approved of by the Board of Directors for the faithful performance of his duties as Treasurer and that he will duly account for and pay over all moneys which may come into his hands.

5. The Board of Audit shall be elected by majority vote of the members at the annual meeting, their duty shall consist of auditing the accounts of the Secretary-Treasurer and presenting a report to the Association and a duplicate of the same to the Minister of Agriculture for Ontario.

6. No officer nor director nor member shall disclose any motions, rulings, movers or seconders of motions or resolutions without the consent of the members of the Board of Directors present at such meeting, and no officer, director, or member shall furnish newspaper reports at variance with the official reports.

7. The person whose name is first placed on the committee shall be Chairman of the Committee. It shall be his duty to call the committee together and do all in his power to conduct successfully the work for which the committee is appointed.

8. The actual and reasonable expenses of the officers and directors, executive committees when attending an annual, board or executive meeting shall be paid by this Association. The Seretary-Treasurer is hereby authorized to pay such accounts on receipt of a detailed statement unless otherwise directed.

9. The actual and reasonable expenses of the Secretary-Treasurer shall be paid when attending all meetings connected with this Association, and in the discharge of the various duties devolving upon him in looking after the interests of the Association.

10. Not less than twenty-five members shall be a quorum to transact business for the Association. Not less than six members shall be a quorum at a Board of Directors' meeting, and not less than three members shall be a quorum at an executive meeting.

11. The officers or members of the Executive Committee or any committee may conduct by correspondence the duties assigned to said officers executive or committee by the constitution or by-laws or by the Association when such a course is deemed advisable by said officers, executive, or committee.

12. The director, or directors living nearest to the place where district meetings are to be held shall provide a place for the holding of such meeting and shall look after all preliminaries.

13. The officers of the Association shall be elected at the first meeting held by the Board of Directors except as hereinbefore provided for.

14. At least two weeks' notice shall be given of each annual meeting, naming the time and place of meeting, notice may be given through the press or by circular letter mailed to each member.

15. A directors' meeting shall be called by mailing at a reasonable time before the date of meeting to each officer or director a notice of meeting as above provided.

16. An Executive Committee meeting shall be called by mailing at a reasonable time before the date of meeting to each member of committee a notice of meeting.

17. Any amendments, alterations or repeal of a by-law shall be made in writing and brought before the annual meeting, and shall require a majority vote of the members present at such meeting for the adoption of the same.

ORDER OF BUSINESS.

1. Reading minutes of previous meetings.
2. Reports of officers.
3. Reports of committees.
4. Unfinished business.
5. Accounts.
6. New business.
7. Adjournment.

ORDER OF MEETINGS.

1. Except by permission of the presiding officer no member or other person shall speak except to ask a question or to introduce a motion or speak to the same.

2. In the discussion following the introduction of a subject no person shall speak more than twice nor for a longer time than five minutes except by a vote of the meeting.

3. When a question is under discussion no motion shall be in order except the following (1) to adjourn, (2) to postpone, (3) to amend. These motions take precedence in the order named and the first two shall be decided without debate.

4. Before the vote is taken on any motion or amendment, the President shall ask, "Is the meeting ready for the question"?

5. The motion shall not be put so long as any member desires to speak and is in order.

APPROVAL OF MINISTER OF AGRICULTURE.

The foregoing constitution and by-laws shall come into effect as soon as the same shall be approved by the Honorable the Minister of Agriculture for the Province of Ontario.

Approved by Minister of Agriculture on November 28th, 1908, and confirmed by the Association on January 13th, 1909.

THE DAIRYMEN'S ASSOCIATION OF EASTERN ONTARIO.

PREAMBLE.

1. This organization shall be known as the Dairymen's Association of Eastern Ontario, and shall have for its object the furthering of the interests of the dairy industry in all its branches, in that part of the Province.

(a) By holding an Annual Convention for the consideration of questions relating thereto.

(b) By co-operating in every way possible with the dairymen in the various dairy sections, and by holding local dairy meetings therein.

(c) By collecting, arranging and disseminating useful information.

(d) By co-operating in promoting the educational work of the Ontario Department of Agriculture.

(e) And by such other means as may be approved by the Minister of Agriculture.

CONSTITUTION AND BY-LAWS.

1. The membership thereof shall consist of annual subscribers, of one dollar each, or such other sums as shall be dtermined by the Board of Directors, but other persons who have been appointed by the Board of Directors from year to year, may be placed on the list of Honorary Members without the payment of such annual fee.

2. The annual meeting of the Association shall be held at such time and place as may be determined by the Board of Directors, and at such annual meeting a Board, consisting of eighteen directors, shall be elected by the members thereof to transact the business of such Association during the next ensuing year, or until their successors in office are appointed.

3. The Association year shall be the calendar year.

4. The directors shall elect from among themselves an Executive Committee of seven, which shall have the right to conduct such business of the Association as the directors may specify.

OFFICERS.

5. The officers shall consist of President, First Vice-President, Second Vice-President, Secretary and Treasurer and a Board of Audit composed of two members.

DUTIES OF OFFICERS.

6. The President shall preside at all meetings of the Association, decide all questions of Order, make such suggestions as he may deem necessary in the interests of the Association, and shall be *ex-officio* member of all committees.

7. The Vice-President, or in his absence, the Second Vice-President, shall perform all the duties of the President in his absence.

8. The Secretary shall keep all the records of the Board of Directors, furnish certificates of membership, notify all the directors of every regular or special meeting of the Board, keep accurate minutes of the transactions of such meetings, conduct all correspondence of the Board as a body, present at each annual meeting a full report of the previous year's proceedings of the Association, as well as a list of the membership and the officers elected, together with such general information on matters of special interest to dairymen as the Association may have obtained, and perform such other acts appertaining to his office as Secretary as may be required by the Board.

9. The Treasurer shall receive and account for all moneys belonging to the Association, pay all bills and accounts that have been approved of by the Association's Executive Committee, and shall, before entering upon the duties of his office, enter into bonds with security, which shall be approved of by the Board of Directors.

10. The Board of Audit shall consist of two members, one of which shall be elected by the vote of the membership at the annual meeting and the other shall be appointed by the Board of Directors.

Their duties shall consist of auditing the accounts of the Treasurer and presenting a report to the Association and a duplicate of the same to the Minister of Agriculture.

11. The local dairy meetings shall be held at such times and places as a committee, composed of the President, Secretary, Chief Instructor and the Director of Dairying, shall determine.

The director or directors living nearest to the place where such meetings are to be held shall provide a place for the holding of such meetings and shall look after such preliminaries.

12. The officers of the Association shall be elected at the first meeting held by the Board of Directors, except as hereinbefore provided for.

13. The foregoing by-laws shall come into effect on the eleventh day of January, A.D. 1907, or as soon thereafter as the same shall be approved by the Honourable the Minister of Agriculture for Ontario.

Approved by the Minister of Agriculture, April 30th, 1907.

AN ACT TO REGULATE THE MANUFACTURE OF DAIRY PRODUCTS.

[Assented to April 13, 1909].

His Majesty, by and with the advice and consent of the Legislative Assembly of the Province of Ontario, enacts as follows:—

1. This Act may be cited as "The Dairy Products Act."

2. In this Act the word "Minister" shall mean the Minister of Agriculture, and the word "Inspector" shall mean any inspector appointed under "The Milk, Cheese and Butter Act."

3. In this Act a "Creamery" shall mean any place to which is brought the milk or cream from the herds of three or more persons for the purpose of being manufactured into butter for public sale; and "Cheese Factory" shall mean any place to which is brought the milk from the herds of five or more persons for the purpose of being manufactured into cheese for public sale.

4. On or before the first day of January, 1910, the owner, proprietor or manager of every creamery, cheese factory, milk condensory, milk powder factory or other establishment for the manufacture of milk products shall register with the Minister of Agriculture, on forms to be supplied by him, stating the nature of business carried on, the exact location of the same, and such other information as to ownership as may be required by the Minister, and an exact record of all such registrations shall be kept by the Minister and shall be open to public inspection.

5.—(1) On and after the first day of January, 1910, no person or persons, company or corporation shall carry on business in a creamery, milk condensory, milk powder factory or the manufacture of any form of dairy products in any building or place not recorded in the list referred to in section 4, without first applying to the Minister of Agriculture and receiving from him permission to do so, and this permission shall be granted only after a report upon the same has been filed, signed by an inspector.

(2) Refusal to grant permission under this section may be based upon lack of proper equipment, or unsanitary conditions.

(3) An appeal from the decision of the Minister may be made by the applicant to the Lieutenant-Governor in Council whose decision shall be final.

6. Upon the report of an inspector that any creamery, cheese factory, milk condensory, milk powder factory or other place for the manufacture of dairy products is not in a satisfactory sanitary condition or is inadequately equipped for the manufacture of dairy products, the Minister may order the owner or manager of the same to close it down forthwith and it shall be kept closed until such time as the inspector reports that it has been put into a satisfactory sanitary condition and is adequately equipped for the manufacture of dairy products.

7. On and after the first day of January, 1911, no person shall act or be allowed to act as chief maker in any creamery or cheese factory who does not hold a certificate of qualification from the Dairy School of the Ontario Agricultural College or from the Eastern Dairy School.

(a) In place of the above certificate of qualification a special permit may be issued at any time by the Minister upon the recommendation of an inspector on the general grounds of experience and competency.

8. Any person violating the provisions of this Act shall, on conviction thereof, be liable to a fine not exceeding $10, and, upon refusal to pay the same, shall be liable to imprisonment for a period not exceeding thirty days.

THE MILK, CHEESE AND BUTTER ACT.

(As amended in 1909).

His Majesty, by and with the advice and consent of the Legislative Assembly of the Province of Ontario, enacts as follows:—

Standard of Milk in Creameries.

1. This Act may be cited as "The Milk, Cheese and Butter Act."

2. *(Repealed in 1909).*

3. The owners or board of management of any creamery in the Province of Ontario, may make such rules and regulations as may be advisable for the due carrying on of the business of the creamery.

4. The patrons of all creameries may be required to subscribe their names to such rules and regulations, and the rules and regulations shall be binding on the patrons, owners and board of management who have so subscribed.

Prevention of Frauds.

5. It shall be lawful for the owner or manager of a cheese or butter manufactory to require the owner or custodian of any cow or cows whose milk is being bought for, or supplied or sent to, the manufactory, to submit such cow or cows at his farm or other premises where such cows are usually kept, to such milk test, by persons named by such owner or manager, as may be necessary for the said persons to ascertain the quantity and quality of the milk of such cow or cows, on any day, and at such time on any such day as may be appointed by said owner or manager, and in case the owner or custodian of the cows refuses to so submit them, or obstructs in the execution thereof the persons engaged in making the milk test, or interrupts the test, or interferes in any way with the test, or the application of its result, he shall, on complaint before any Justice or Justices of the Peace, forfeit and pay for every such offence a sum of not less than $10 nor more than $100, in the discretion of the Justice or Justices of the Peace who may hear such complaint, together with the costs of the prosecution, if so ordered, and in default of payment of the penalty and costs, shall be liable to be committed by the convicting Justice or Justices of the Peace, to the common gaol of the county, with hard labour for any period not exceeding six months or until said penalty and the costs of enforcing same are sooner paid.

6. It shall be lawful for the owner or manager of any cheese or butter manufactory who suspects any person of selling, supplying, sending or bringing milk to the manufactory, of any offence under this Act, to enter upon or to appoint some person or persons to enter upon, and such appointed person may enter upon the premises of the suspected person, with or without notice, and take samples of milk from the cow or cows from which the supposed offender was or had been immediately before then procuring the milk or part of the milk so sold, supplied, sent or brought as aforesaid; and any such suspected person who obstructs or refuses to permit the taking of any such sample shall, on conviction thereof, be liable to a penalty of not less than $10 nor more than $50 with costs of the prosecution, and in default of payment thereof, shall be liable to be imprisoned in the common gaol of the county in which the offence has been committed for a period not exceeding three months with hard labour.

7. No person shall sell or offer for sale in any city, town or incorporated village, and no person shall sell or supply under contract to any person in any city, town or incorporated village, and no person shall sell, supply, bring or send to a cheese or butter manufactory, or the owner or manager thereof, milk diluted with water, or in any way adulterated, or milk from which any cream has been taken, or milk commonly known as "skimmed milk," or milk in which any preservative is contained, without distinctly notifying in writing the owner or manager of such cheese or butter manufactory, or the person or persons to whom it is sold in cities, towns or incorporated villages, that the milk so sold, supplied or brought to be manufactured or otherwise disposed of, has been so diluted with water, or adulterated, or had the cream so taken from it, or become milk commonly known as "skimmed milk," or has had a preservative added to it, as the case may be.

8. No person who, in the course of his business agrees to sell, supply, bring or send to any cheese or butter manufactory, or the owner or manager thereof, to be manufactured, the milk of any cow or cows, shall in the course of such dealing and business, keep back any part of the milk of such cow or cows without distinctly notifying in writing, the owner or manager of such cheese or butter manufactory what portion of the milk he has so kept back.

9. Notwithstanding anything contained in this Act, no person shall be subject to any penalties under this Act for selling in any city, town or incorporated village milk from which any of the butter fat or cream has been removed, provided the milk so sold or offered for sale is advertised as "skimmed milk," and the person to whom the milk is sold is informed that the same is "skimmed milk."

10. No person shall sell, supply, bring or send to a cheese or butter manufactory, or owner or manager thereof, to be manufactured, any milk that is tainted or partly sour without distinctly notifying, in writing, the owner or manager of such cheese or butter manufactory of such milk being tainted or partly sour.

11. No person supplying milk or cream to a cheese factory or creamery, or for sale in cities, towns or incorporated villages, shall keep his dairy, milk house, milk stand, or any vessels or equipment used for the storing or the carrying of milk or cream, in an unclean or unsanitary condition.

12.—(1) Every cheese factory and creamery manufacturing butter or cheese for public use or sale, and the premises upon which milk or cream is offered for sale and the surroundings of every such cheese factory and creamery and premises shall be kept in a clean and sanitary condition, and all the water used therein for the manufacture of any dairy products must be clean and pure.

(2) The owner or manager of any cheese factory or creamery or premises upon which milk or cream is offered for sale refusing or neglecting to observe the provisions of this section after being warned or advised by a dairy inspector, shall, upon conviction thereof before any Justice or Justices of the Peace, forfeit and pay a sum of not less than $50 nor more than $200, together with the costs of prosecution, and in default of payment of such penalty and costs shall be liable to be committed to the common gaol of the county with hard labor for a period not exceeding six months.

13. Upon the recommendation of the Minister of Agriculture, the Lieutenant-Governor in Council may appoint one or more persons as inspectors for the enforcing of the provisions of this Act, who shall be known as Dairy Inspectors. The Lieutenant-Governor in Council may determine the remuneration to be paid to such inspectors.

14.—(1) All dairy inspectors appointed under this Act shall have free access and admission to all cheese factories and creameries and the premises upon which milk or cream is offered for sale located within the Province and to all lands adjoining the same, and to the premises of all persons supplying milk or cream to any cheese factory or creamery, or for sale in cities, town or incorporated villages; they shall also be empowered to take and test samples of milk found in cheese factories or creameries or in the possession of milk dealers having the same for sale in cities, towns or incorporated villages, or in transit between producers and cheese factories and creameries, between producers and dealers or between dealers and consumers in cities, towns or incorporated villages; and they shall have the right to take and test samples of milk found upon the premises of producers supplying milk to cheese factories or creameries or for sale in cities, towns or incorporated villages, and may take and test samples from cows which have been producing milk to be sold to cheese factories or creameries or to be delivered for sale in cities, towns or incorporated villages, and any person refusing admission to the same or offering obstruction to the work of inspection or the taking of samples or testing of same shall be subject to the penalties provided in section 16.

(2) Every inspector appointed under this Act shall have the right at any time to take samples for testing any product manufactured in any cheese factory, creamery, milk condensery, milk powder factory or other establishment for the manufacture of milk products for sale. (*New in 1909*).

15. Every inspector appointed under this Act shall make such reports and in such form as the Minister may direct.

16.—(1) Any person who, by himself, or by his servant or agent, violates any of the provisions of sections 7, 8, 10 or 14 of this Act, upon conviction thereof before any Justice or Justices of the Peace, shall forfeit and pay a sum of not less than $5 nor more than $50, together with the costs of prosecution, in the discretion of the Justice or Justices, and in default of payment of such penalty and costs, shall be liable to be committed to the common gaol of the county, with hard labor, for any period not exceeding six months, unless the said penalty and the costs of enforcing same are sooner paid.

(2) For the purpose of establishing the guilt of any person under the said sections 7 or 8 of this Act, it shall be sufficient *prima facie* evidence to show that such person, by himself, his servant, or agent, sold, supplied, sent or brought, to be manufactured, to any cheese or butter manufactory, milk substantially below the standard of that actually drawn, or by the accused represented as having been drawn from the same cow

or cows within the then previous or subsequent two weeks, provided the comparison or test is made by means of a lactometer and Babcock Tester, or by some other adequate means of making the comparison.

(3) The said sections 7, 8 and 10 shall not apply where the person charged with the offence proves to the satisfaction of the Justice or Justices of the Peace that the alleged offence was committed by some person or persons other than a member of the family of the person charged with the offence or was committed by some person or persons other than his servant or agent, and also that the offence was committed without his knowledge or consent.

(4) In any complaint made or laid under said sections 7, 8, 10 or 14 of this Act, and in any conviction thereon, the milk complained of may be described as deteriorated milk, without specification of the cause or mode of deterioration, and such description shall be a sufficient description of the offence to sustain a conviction, and in any complaint, information or conviction under this Act the matter complained of may be declared, and shall be held to have arisen within the meaning of "The Ontario Summary Convictions Act," at the place where the milk complained of was to be manuafctured, notwithstanding that the deterioration thereof was effected elsewhere.

17. Any pecuniary penalty imposed by the preceding section in respect of selling, supplying or bringing milk to a cheese or butter manufactory, shall, when recovered, be payable one-half to the informant, and the other one-half to the owner, treasurer or president of the manufactory to which the milk was sent, sold or supplied for any of the purposes aforesaid in violation of any of the provisions of this Act, to be distributed among the patrons thereof in proportion to their respective interests in and profits thereof.

18.—(1) Any butter or cheese manufacturer who knowingly and fraudulently uses, or directs any of his employees to use for his or their individual benefit, any cream from the milk brought to any cheese or butter manufactory, without the consent of all the owners thereof, shall, for every offence, forfeit and pay a sum not less than $1 nor more than $50, in the discretion of the Justices before whom the case is heard.

(2) Any two or more Justices of the Peace, having jurisdiction within the locality where the offence has been committed, may hear and determine such complaint upon the oath of one or more credible witnesses, and shall have power, in case the penalty and costs awarded by them are not forthwith paid upon conviction, to levy the same by distress and sale of the goods and chattels of the offender, by warrant under their hands and seals or the hands and seals of any two of them, and the penalty, when recovered, shall be paid over by such Justices, one-half to the person complaining, and one-half to the treasurer of the municipality, district or place where the offence has been committed; and in default of payment or sufficient distress, the offender may, by warrant signed and sealed as aforesaid, be imprisoned in the common gaol for a period not less than one day nor more than twenty-five days, at the discretion of such Justices, or any two of them, unless such penalty, costs and the charges of commitment are sooner paid.

(3) Any party aggrieved by such fraudulent conduct as aforesaid may at his election sue the offender in any Civil Court of competent jurisdiction, and recover from him the amount of damages sustained, and levy the same with the costs according to the ordinary practice of the Court in which such action is brought.

19. No Justice or Justices having any pecuniary interest in a cheese or butter manufactory as aforesaid, shall hear or determine any complaint under this Act.

20. Chapter 251 of the Revised Statutes of Ontario, 1897, and amendments thereto are repealed.

DAIRY INSTRUCTION IN THE PROVINCE OF ONTARIO.

By George A. Putnam, Director of Dairy Instruction for Ontario.

[Written for "O. A. C. Review," April, 1909].

While the present system of sending specialists in cheese-making and butter-making to all factories and creameries in the Province, throughout the season of manufacture, for the purpose of assisting the makers in producing a more uniform and better quality of cheese and butter, inspecting the factories for sanitary condition, and advising the patrons in the care and handling of the raw material, is a development of recent years, we find that, as far back as 1879, the Dairymen's Association of Western Ontario employed Professor L. B. Arnold, of New York State, to go from factory to factory that he might assist the makers in introducing methods of manufacture with the view of improving the quality and establishing a uniformity in the product. Professor J. B. Harris, of Antwerp, New York, was engaged by the Dairymen's Association of Eastern Ontario, to carry on similar work in 1880, 1881 and 1882. In 1883 his field of labor was in the western portion of the Province, while Messrs. Whitton and Bissell acted as instructors in Eastern Ontario.

The late Hon. Thos. Ballantyne who did more to advance the dairy industry than any other individual in Ontario in the eighties, for a year or two years, at least, bore the expense of sending a specialist in cheese-making to visit a number of factories in Western Ontario, believing that the ultimate success of the industry was largely dependent upon quality and uniformity, which could best be secured by sending an up-to-date man from factory to factory throughout the season of manufacture. At the annual meeting of the Western Association, held February, 1884, the Hon. Mr. Ballantyne stated:—"I know some places where the goods were of the poorest description, and the maker was desirous of having Professor Harris come, and the cheese were much better from the first day of Professor Harris' visit to the factory until the end of the season. If our funds would admit of it, it would be a good thing to employ a number of instructors so that they could be all the time about the factories; it would pay."

While it was considered wise on the part of the officers of the Dairymen's Associations to secure instructors from New York State during the years 1879-1883 inclusive, it is a matter of congratulation to Canadians that it has not since then been thought necessary either by the Associations or the Department of Agriculture to go outside of the Province for specialists in this branch of dairy education. On the other hand, many of our best men have been sought as commissioners, teachers and instructors in dairying by many States of the Union, the British Isles, New Zealand, Australia and other countries.

Dairy instruction was carried on by the Dairymen's Associations to a greater or less extent and with much benefit to the industry, throughout all the years from 1879, until in 1901 we find eight men employed by the Association of Eastern Ontario and three in Western Ontario. The creameries were also receiving instruction at this time. We find in that year for the first time that the work of the instructors was recognized by the patrons as educational rather than that of detectives. The time devoted to the patrons was for the purpose of instructing them in the care and handling of the milk rather than in an endeavor to detect skimming, watering or the keeping of strippings for home use. This was a decided step in advance. In 1902, three men were employed by the Association in Eastern Ontario and nine in Western Ontario. In this year two groups or syndicates were formed, and a man placed in direct charge of a limited number of factories. This enabled him to make periodical visits and to establish a uniformity and improvement which had not been manifest up to this time. The experiment proved so successful that in the following year, 1903, we had for the first time a chief instructor for both Eastern and Western Ontario, whose duty it was to keep in close touch with the instructors employed by the Associations and to direct them along uniform lines, thus establishing a system covering practically the whole of the Province. The two Chief Instructors were officially appointed by the Provincial Department of Agriculture.

In 1904 the instruction work assumed such large proportions that the Department of Agriculture decided to relieve the Dairymen's Associations of the financial burden and made an appropriation for the payment of thirty-two regular instructors and two chief instructors, one for Eastern Ontario and one for Western Ontario. Factories which desired assistance were required to pay ten dollars to the Department of Agriculture for the services rendered. This did not cover quite one-third of the total outlay of over $23,000 for the season. The factories were arranged in syndicates or groups and each instructor was held responsible through the chief instructor for the work in his district. The work was better arranged than ever before and improvements were

more marked. In addition to the regular work of instruction 136 meetings were held during the summer months. At these meetings the instructors were enabled to give the producers information as to the best methods of handling their milk, the necessity for an improved water supply, etc. The improvements in factories during the season amounted to $158,000, many of these being made at the suggestion of the instructors.

In 1905 we find thirty-seven instructors with two chief instructors. Eight hundred and eleven factories were included in the groups and two hundred and thirty-nine factory meetings were held. The Dairy Schools at Kingston and Guelph gave a ten-days' course, specially for the benefit of the instructors. This enabled them to receive instruction upon the most improved methods and to carry it on to the makers throughout the country, and tended to greater uniformity.

The Provincial Legislature, in 1906, passed an Act requiring that all cheese factories and creameries be kept in a clean and sanitary condition and made provision for the appointment of inspectors upon the recommendation of the Minister of Agriculture. Accordingly two men were appointed to enforce this law, and the result was that much improvement was made in whey tanks, drainage, and the general surroundings of factories. We also see in this year an increased number of curd tests being made with the object of tracing undesirable flavors which developed in the manufacture of the cheese.

The season of 1907 witnessed another decided step in advance. Up to this time the factories desiring the services of instructors were required to pay a portion of the expenses connected therewith. The weakness in this system was that the factories most in need of assistance and those which could not afford to engage a high-priced maker were the ones which did not receive assistance. It was therefore decided by the Department to assume the whole financial responsibility and give instruction to all factories and creameries without making any charge whatever. This placed the instructors in an independent position which they did not enjoy before. It can easily be seen that when the factorymen were paying a portion of the expenses of instruction, that the instructors hesitated to make demands or to offer suggestions which they would otherwise have made had they been entirely independent. Then again the poorer factories received the same attention as the larger and more prosperous ones, with the result that a greater uniformity was established than was found possible under the old system.

In Eastern Ontario one hundred and seventy-eight factories received instruction for the first time in 1907, and a few factories in Western Ontario which had not up to this date been included in the instruction work were visited for the first time. We find one thousand one hundred and eighty-two factories and ninety-nine creameries receiving regular visits from the instructors and a definiteness of purpose and uniformity which had not existed previously.

Regular instructors were all clothed with the power of sanitary inspectors, which proved of great assistance in having the sanitary conditions of the factories improved. Heretofore they had been in a position only to *make suggestions* and *requests*. Now they were in a position to *demand* those improvements and alterations which were necessary to place the premises in a sanitary condition.

Up to this time the instructors devoted considerable attention to testing milk, and in some cases making prosecutions for the adulteration of milk. At the request of the Department the Western Association employed a man to look after this work. The instructors co-operated to a certain extent, in the gathering of evidence, but the work of prosecuting was left to the special official. This still further strengthened the position of the instructors, especially so far as the patrons were concerned. The same system of prosecution was adopted by the Eastern Association in 1908, with most satisfactory results. The magistrates throughout the country evidently appreciate the action of the association in dealing with the adulteration of milk in this manner, and are in the majority of cases imposing substantial fines. There is a marked decrease in the percentage of adulterated samples, and it is hoped and expected that the coming season will see a still further decrease.

It is generally admitted by those in close touch with the dairy industry that the method of instruction which we now have in Ontario, the appointng of special officials to deal with the adulteration of milk, and the holding of factory meetings and district dairy meetings, has resulted in a greater improvement during the past two years than in the preceding several years.